Vol. 1021 Number 4

OFFICIAL GAZETTE

of the

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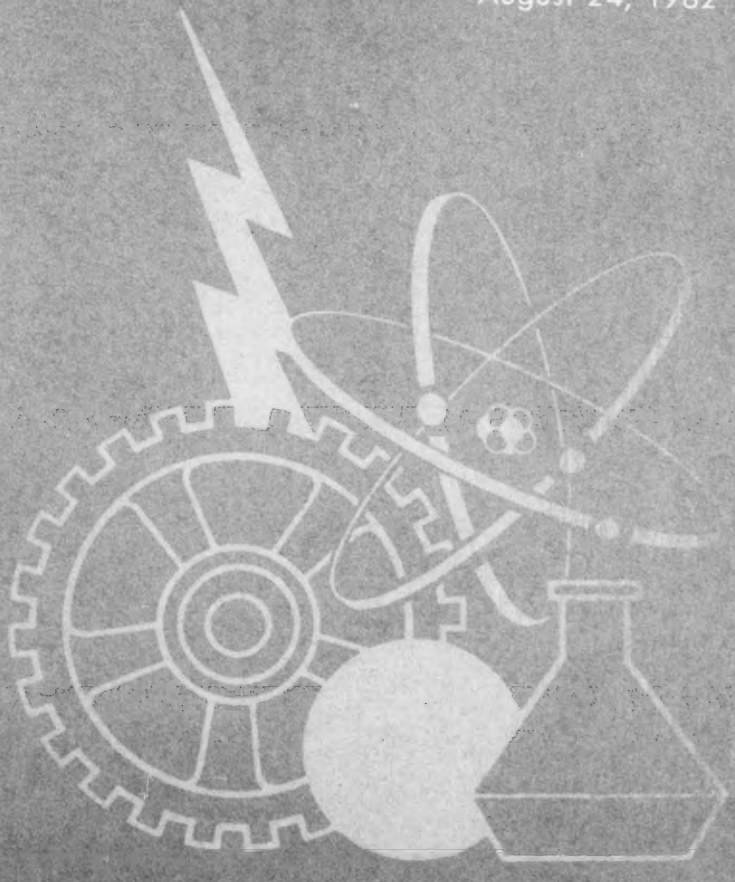

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August 24, 1982 Volume 1021 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,019,320, Re. S.N. 392,438, Filed June 28, 1982, Cl. 60/226R, EXTERNAL GAS TURBINE ENGINE COOLING FOR CLEARANCE CONTROL, Ira H. Redinger, Jr., et al., Owner of Record: *United Technologies Corp., Hartford, Conn.,* Attorney or Agent: Norman Friedland, et al., Ex. Gp.: 343

4,159,083, Re. S.N. 340,202, Filed Jan. 18, 1982, Cl. 241/68, DEBRIS SEPARATING CHIPPER, Joseph A. Lapointe, Owner of Record: *Domtar, Inc., Hudson, Quebec, Canada,* Attorney or Agent: C.A. Rowley, Ex. Gp.: 322

4,198,351, Re. S.N. 392,428, Filed June 25, 1982, Cl. 260/449, FORMALDEHYDE PRODUCTION PROCESS, Anthony J. Branecky, et al., Owner of Record: *Celanese Corp., New York, N.Y.,* Attorney or Agent: Marvin Turken, et al., Ex. Gp.: 126

4,254,781, Re. S.N. 391,466, Filed June 23, 1982, Cl. 131/111, METHOD AND APPARATUS FOR DELIVERING PARTICLES OF TOBACCO TO SHREDDING MACHINES, Willi Thiele, et al., Owner of Record: *Hauni-Werke Korber & Co., K.G., Hamburg, Germany,* Attorney or Agent: Peter K. Kontler, et al., Ex. Gp.: 335

4,285,353, Re. S.N. 383,096, Filed May 28, 1982, Cl. 134/181, FILTER WITH AUTOMATIC CLEANING, Pierre Colomer, Owner of Record: *Interfiltre, S.A., Livarot, France,* Attorney or Agent: Philip Rodman, Ex. Gp.: 243

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 29,221, Reexam. No. 90/000,229, Requested: July 19, 1982, Cl. 188/378, ACCELERATION SENSITIVE MOTION SNUBBER, Elmer Chensheng Yang, Owner of Record: *Pacific Scientific Co., Anaheim, Calif.,* Attorney or Agent: Gordon H. Olson, Esq., Ex. Gp.: 310, Requester: Leonard Holtz, Esq., New York, N.Y.

3,796,048, Reexam. No. 90/000,223, Requested: June 30, 1982, Cl. 60/5, TURBOCHARGED INTERNAL COMBUSTION ENGINE WITH RESONANCE INDUCTION PIPE SYSTEM, Imre Annus, et al., Owner of Record: *Autoipari Kutato Intezet (Budapest) & Csepel Autogyar—Szigethalom, Hungary,* Attorney or Agent: Gabor J. Kelemen, Ex. Gp.: 340, Requester: Owner of Record

4,004,934, Reexam. No. 90/000,231, Requested: July 22, 1982, Cl. 501/88, SINTERED DENSE SILICON CARBIDE, Svante Prochazka, Owner of Record: *General Electric Co., Schenectady, N.Y.,* Attorney or Agent: G.P. Hoare, Jr., Esq., Ex. Gp.: 110, Requester: General Electric Co., Research & Development, Schenectady, N.Y.

4,118,413, Reexam. No. 90/000,233, Requested: July 26, 1982, Cl. 260/465, PREPARATION OF PHENOXYBENZYL ESTERS, Derek A. Wood, Owner of Record: *Shell Oil Co., Houston, Tex.,* Attorney or Agent: Nancy J. Gracey, Ex. Gp.: 120, Requester: Stauffer Chemical Co., Westport, Conn.

4,215,431, Reexam. No. 90/000,228, Requested: July 20, 1982, Cl. 455/43, WIRELESS TRANSMISSION SYSTEM, John Nady, Owner of Record: *Inventor,* Attorney or Agent: Craig & Antonelli, Ex. Gp.: 233, Requester: John Nady, Oakland, Calif.

4,287,537, Reexam. No. 90/000,232, Requested: July 28, 1982, Cl. 358/299, METHOD OF REPRODUCING GRAPHIC MATERIAL ON AN INTAGLIO FORM, Paul Pfau, et al., Owner of Record: *Simom S.A., A Corp. of Switzerland, Hanibuhl, Switzerland,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 235, Dr.-Ing. Rudolf Hell, GmbH, West Germany

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Trademark Suits

Notices under 15 U.S.C. 1116;
Trademark Act of July 5, 1946.

Reg. No. 75,365 (ALLIGATOR BRAND AND DESIGN), Lacoste Alligator S.A.; **Reg. No. 706,041** (ALLIGATOR), **same; Reg. No. 707,572** (GROTESQUE OF ALLIGATOR IN CIRCULAR DESIGN), **same; Reg. No. 867,953** (ALLIGATOR DESIGN), **same; Reg. No. 1,084,409** (DESIGN MISCELLANEOUS), **same, filed** Nov. 5, 1980, D.C.N.J. (Newark), Doc. 80-3561, *Lacoste Alligator S.A., et al* v. *Edward A. Devlin III, et al.* Consent order for permanent injunction and stipulation of dismissal of action filed June 2, 1981. **Same, filed** May 20, 1981, D.C.N.J. (Newark), Doc. 80-1537, *Lacoste Alligator S.A., et al* v. *All-American Emblem Corp.* Order of dismissal of action filed June 29, 1981.

Reg. No. 75,365 (ALLIGATOR BRAND AND DESIGN), Lacoste Alligator S.A.; **Reg. No. 706,041** (ALLIGATOR), **same; Reg. No. 707,572** (GROTESQUE OF ALLIGATOR IN CIRCULAR DESIGN), **same; Reg. No. 867,953** (ALLIGATOR DESIGN), **same; Reg. No. 1,084,409** (DESIGN MISCELLANEOUS), **same; Reg. No. 1,101,539** (ALLIGATOR DESIGN), **same; Reg. No. 1,108,987** (DESIGN MISCELLANEOUS),

same; Reg. No. 1,108,988 (ALLIGATOR DESIGN), **same, filed** Oct. 24, 1980, D.C., S.D.N.Y., Doc. 80-Civ-6039 JMC, *Lacoste Alligator S.A., et ano* v. *Happy Appliques, Inc.* Defendants are permanently enjoined and restrained from further infringing Plaintiff's trademarks. Filed Mar. 5, 1981.

Reg. No. 297,594 ("VL" AND DESIGN), Louis Vuitton S.A., **filed** June 15, 1982, D.C., S.D.N.Y., Doc. 82-Civ-3919 CLB, *Louis Vuitton S.A.* v. *Walco Leather Co., Inc.* Action discontinued without costs to either party on June 18, 1982.

Reg. No. 322,591 (CORONET AND DESIGN), Michaels Stern & Co., Inc., **filed** Nov. 13, 1981, D.C., S.D.N.Y., Doc. 81-Civ-7079, *Coronet Casuals, Inc.* v. *Coronet Sportswear, Inc.* Defendants are permanently enjoined from using the designation Coronet and from using any term or design similar in connection with any business. Filed June 2, 1982.

Reg. No. 398,015 (PRINTING INKS ROLLER PRODUCTS AND DESIGN), International Printing Pressman and Assistant's Union of North America; **Reg. No. 398,016** (PRINTING PRESSMAN AND ASSISTANTS AND DESIGN), **same; Reg. No. 398,017** (PRINTING PRESSMAN AND ASSISTANTS AND DESIGN), **same; Reg. No. 398,018** (PRINTING SPECIALTIES PAPER PRODUCTS AND DESIGN), **same; Reg. No. 398,019** (PRINTING SPECIALTIES PAPER PRODUCTS AND DESIGN), **same; Reg. No. 398,020** (SPECIALTIES DISTRIBUTORS PAPER PRODUCTS AND DESIGN), **same; Reg. No. 398,021** (SPECIALTIES DISTRIBUTORS PAPER PRODUCTS AND DESIGN), **same, filed** June 4, 1982, D.C., N.D. Ind. (Ft. Wayne), Doc. F82-202, *International Printing & Graphic Communications Union* v. *The Cammeron Corp., et al.*

Reg. No. 398,016. **(See Reg. No. 398,015.)**

Reg. No. 398,017. **(See Reg. No. 398,105.)**

Reg. No. 398,018. **(See Reg. No. 398,015.)**

Reg. No. 398,019. **(See Reg. No. 398,015.)**

Reg. No. 398,020. **(See Reg. No. 398,015.)**

Reg. No. 398,021. **(See Reg. No. 398,015.)**

Reg. No. 402,475 (AA AND DESIGN), Early California Industries, Inc., **filed** May 10, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-2278 IH, *Early California Industries, Inc., et al* v. *Pacific Eastern Trading Corp.*

Reg. No. 568,404 (ORKIN), Orkin Exterminating Co., Inc.; **Reg. No. 568,406** (ORKIN AND DESIGN), **same; Reg. No. 568,408** (ORKIN AND DESIGN), **same, filed** Mar. 25, 1982, D.C., S.D. W. Va. (Charleston), Doc. 82-2127, *Orkin Exterminating Co., Inc.* v. *Virgil D. Parrill, et al, doing business as Orko Termite & Pest Control.* **Same, filed** Dec. 30, 1980, D.C. N.J. (Newark), Doc. 80-4143, *Orkin Exterminating Co.* v. *Orkin Termite & Pest Control Corp.* Order dismissing action filed May 26, 1982.

Reg. No. 568,406. **(See Reg. No. 568,404.)**

Reg. No. 568,408. **(See Reg. No. 568,404.)**

Reg. No. 587,025 (AMANA), Amana Refrigeration, Inc.; **Reg. No. 605,819, same; Reg. No. 715,075, same; Reg. No. 889,068, same, filed** May 25,1982, D.C., S.D. Calif. (San Diego), Doc. 82-0662-E(I), *Amana Refrigeration, Inc.* v. *Alan C. Koonin, doing business as Cook and Cool West and doing business as La Mesa Cook and Cool.* **Same, filed** May 25, 1982, D.C., S.D. Calif. (San Diego), Doc. 82-0663-G(M), *Amana Refrigeration, Inc.* v. *Michael L. Edwards, doing business as Bea Vac-Sew Center.*

Reg. No. 605,819. **(See Reg. No. 587,025.)**

Reg. No. 636,452 (SARAH COVENTRY), C. H. Stuart, Inc.; **Reg. No. 777,377** (COVENTRY), **same; Reg. No. 910,513** (COVENTRY), **same; Reg. No. 910,515**(SARAH COVENTRY), **same; Reg. No. 923,157** (SARAH COVENTRY DOLL), **same; Reg. No. 950,771** (COVENTRY), **same; Reg. No. 951,916** (SARAH COVENTRY), **same; Reg. No. 998,466** (SARAH COVENTRY), **same; Reg. No. 1,018,020** (COVENTRY), **same; Reg. No. 1,021,070** (SARAH COVENTRY), **same; Reg. No. 1,026,740** (SARAH COVENTRY), **same; Reg. No. 1,028,681** (SARAH COVENTRY), **same; Reg. No. 1,030,146** (SARAH COVENTRY), **same; Reg. No. 1,032,316** (SARAH COVENTRY), **same; Reg. No. 1,036,813** (SARAH COVENTRY), **same; Reg. No. 1,040,510** (SARAH COVENTRY), **same; Reg. No. 1,043,517** (SARAH COVENTRY), **same; Reg. No. 1,067,233** (COVENTRY), **same; Reg. No. 1,068,149** (SARAH COVENTRY), **same; Reg. No. 1,104,820** (SARAH COVENTRY), **same; Reg. No. 1,118,099** (SARAH COVENTRY), **same; Reg. No. 1,120,400** (COVENTRY), **same; Reg. No. 1,122,860** (COVENTRY), **same, filed** July 7, 1980, D.C., N.D. Iowa (Cedar Rapids), Doc. C 80-1011, *C. H. Stuart, Inc.* v. *Coventry, Ltd.*

Reg. No. 672,568 (SUITIME), Suitime, Inc., **filed** Jan. 13, 1982, D.C., S.D.N.Y., Doc. 82-Civ-0219, *Suitime, Inc.* v. *That Girl in Miami, Inc.* Defendant agrees to refrain from copying, manufacturing, printing, etc. any stylized logo known as Suitime which bears a design reasonably similar to the stylized designs of plaintiff's labels. Filed June 11, 1982.

Reg. No. 706,041. **(See Reg. No. 75,365.)**

Reg. No. 707,572. **(See Reg. No. 75,365.)**

Reg. No. 711,754 (ELAVIL), Merck & Co., Inc., **filed** Nov. 21, 1980, D.C.N.J. (Newark), Doc. 80-3791, *Merck & Co., Inc.* v. *Barr Laboratories, Inc.* Consent judgment for permanent injunction filed Mar. 23, 1981.

Reg. No. 715,075. **(See Reg. No. 587,025.)**

Reg. No. 724,764 (PANASONIC AND DESIGN), Matsushita Electric Industrial Co.; **Reg. No. 746,848** (PANASONIC), **same; Reg. No. 774,063** (PANASONIC AND DESIGN), **same; Reg. No. 774,124** (PANASONIC AND DESIGN), **same; Reg. No. 800,220** (PANASONIC AND DESIGN), **same; Reg. No. 800,942** (PANASONIC AND DESIGN), **same; Reg. No. 808,808** (N PANASONIC AND DESIGN), **same; Reg. No. 808,840** (N PANASONIC AND DESIGN), **same; Reg. No. 808,841** (N PANASONIC AND DESIGN), **same; Reg. No. 808,849** (N PANASONIC AND DESIGN), **same; Reg. No. 808,862** (N PANASONIC AND DESIGN), **same; Reg. No. 838,277** (PANASONIC HI-TOP AND DESIGN), **same; Reg. No. 859,262** (PANASONIC), **same; Reg. No. 859,287** (PANASONIC), **same; Reg. No. 859,314** (PANASONIC), **same; Reg. No. 860,062** (PANASONIC), **same; Reg. No. 868,381** (PANASONIC), **same; Reg. No. 869,714** (PANASONIC), **same; Reg. No. 902,911** (PANASONIC), **same; Reg. No. 905,883** (PANASONIC), **same; Reg. No. 1,006,629** (PANASONIC), **same; Reg. No. 1,041,215** (PANASONIC), **same; Reg. No. 1,047,045** (PANASONIC), **same, filed** Mar. 20, 1979, D.C. Conn. (Hartford), Doc. H79-176, *Matsushita Electric Industrial Co.* v. *Wallcraft, Inc., et al.* Consent Judgment filed Sept. 9, 1980.

Reg. No. 746,848. **(See Reg. No. 724,764.)**

Reg. No. 758,839 (ST. CHARLES), St. Charles Mfg. Co.; **Reg. No. 1,093,131, same, filed** Feb. 24, 1981, D.C., S.D. Fla. (Ft. Lauderdale), Doc. 81-8073-Civ-JAG, *St. Charles Mfg. Co., et al* v. *Leonard Mercer, et al.* Final Order and Judgment filed Apr. 30, 1982.

Reg. No. 774,063. **(See Reg. No. 724,764.)**

Reg. No. 774,124. **(See Reg. No. 724,764.)**

Reg. No. 777,377. **(See Reg. No. 636,452.)**

Reg. No. 783,371 (DESIGN SUNBURST AND PYLON), Quality Inns International, Inc.; **Reg. No. 886,881** (QUALITY), **same; Reg. No. 1,183,294** (QUALITY INN), **same, filed** May 27, 1982, D.C., M.D. Fla. (Orlan-

do), Doc. 82-269-Orl-Civ-R, *Quality Inns International, Inc.* v. *Thrift Inns, Inc., et al.*

Reg. No. 800,220. (See Reg. No. 724,764.)

Reg. No. 800,942. (See Reg. No. 724,764.)

Reg. No. 808,808. (See Reg. No. 724,764.)

Reg. No. 808,840. (See Reg. No. 724,764.)

Reg. No. 808,841. (See Reg. No. 724,764.)

Reg. No. 808,849. (See Reg. No. 724,764.)

Reg. No. 808,862. (See Reg. No. 724,764.)

Reg. No. 838,277. (See Reg. No. 724,764.)

Reg. No. 855,063 (CARRERA), Carrera International Corp.; **Pat. No. 4,176,921,** Carrera International Corp.; EYEGLASSES HAVING REMOVABLE LENSES, **filed** Dec. 15, 1981, D.C., S.D. Fla. (Miami), Doc. 81-2801-CIV-SMA, *Carrera International Corp.* v. *Eye to Eye Optical, Inc., et al.*

Reg. No. 859,262. (See Reg. No. 724,764.)

Reg. No. 859,287. (See Reg. No. 724,764.)

Reg. No. 859,314 (PANASONIC), Matsushita Electric Industrial Co., Ltd.; **Reg. No. 902,911, same; Reg. No. 1,047,045, same, filed** Oct. 21, 1981, D.C., S.D.N.Y., Doc. 81-Civ-6461, *Matsushita Electric Industrial Co., Ltd.* v. *Advance Transistor Co.*

Reg. No. 859,314. (See Reg. No. 724,764.)

Reg. No. 860,062. (See Reg. No. 724,764.)

Reg. No. 867,953. (See Reg. No. 75,365.)

Reg. No. 868,381. (See Reg. No. 724,764.)

Reg. No. 869,714. (See Reg. No. 724,764.)

Reg. No. 870,475 (ROYAL COPENHAGEN DENMARK AND DESIGN), Den Kongelige Porcelainfabrik A/S; **Reg. No. 896,298, same; Reg. No. 903,866, same; Reg. No. 917,657** (MISCELLANEOUS DESIGN), **same; Reg. No. 1,117,301** (ROYAL COPENHAGEN), **same; Reg. No. 1,139,464** (ROYAL COPENHAGEN), **same; Reg. No. 1,144,568** (ROYAL COPENHAGEN), **same, filed** June 4, 1982, D.C.N.J. (Newark), Doc. 82-1785, *Royal Copenhagen Cone Co., Inc.* v. *Den Kongelige Porcelain Fabric A/S.*

Reg. No. 886,881. (See Reg. No. 783,371.)

Reg. No. 889,068. (See Reg. No. 587,025.)

Reg. No. 896,298. (See Reg. No. 870,475.)

Reg. No. 902,911. (See Reg. Nos. 724,764 and 859,314.)

Reg. No. 903,866. (See Reg. No. 870,475.)

Reg. No. 905,883. (See Reg. No. 724,764.)

Reg. No. 910,513. (See Reg. No. 636,452.)

Reg. No. 910,515. (See Reg. No. 636,452.)

Reg. No. 915,734 (URANTIA), Urantia Foundation; **Reg. No. 948,104, same; Reg. No. 1,013,544** (URANTIAN), **same; Reg. No. 1,089,942** (URANTIA), **same, filed** June 27, 1980, D.C., S.D. Tex. (Houston), Doc. H-80-1428, *Urantia Foundation* v. *First Urantia Society of Houston, et al.*

Reg. No. 916,450 (CHILDREN'S VILLAGE), Children's Village, Inc., **filed** June 17, 1982, D.C., S.D.N.Y., Doc. 82-Civ-3992 ADS, *Children's Village, Inc.* v. *Children's Village, U.S.A.*

Reg. No. 917,657. (See Reg. No. 870,475.)

Reg. No. 922,810 (BURKE), The Vecta Group, Inc., **filed** June 16, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 3779, *Steelcase, Inc.* v. *Kinetics Furniture, Inc.*

Reg. No. 923,157. (See Reg. No. 636,452.)

Reg. No. 937,009 (TAMIYA AND DESIGN), Shunsaku Tamiya, **filed** June 4, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 2802, *Model Rectifier Corp.* v. *Takachiho International, Inc., et al.*

Reg. No. 948,104. (See Reg. No. 915,734.)

Reg. No. 950,771. (See Reg. No. 636,452.)

Reg. No. 951,916. (See Reg. No. 636,452.)

Reg. No. 972,668 (RAFAEL), Cody Jaret Enterprises, Ltd.; **Reg. No. 1,139,987, same, filed** June 25, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4180 RO, *Cody Jaret Enterprises, Ltd.* v. *Feuerman Crevats, Inc.*

Reg. No. 984,005 (RALPH LAUREN AND DESIGN), Polo Fashions, Inc.; **Reg. No. 1,050,722, same; Reg. No. 1,053,873, same; Reg. No. 1,067,651** (POLO BY RALPH LAUREN), **same; Reg. No. 1,067,698** (POLO BY RALPH LAUREN), **same; Reg. No. 1,067,743** (POLO BY RALPH LAUREN), **same, filed** July 25, 1980, D.C., S.D.N.Y., Doc. 80-Civ-4278, *Polo Fashions, Inc., et ano* v. *Chalme, Inc., et al.*

Reg No. 996,511 (KOOL-N-LIGHT), Valmor Products Co.; **Reg. No. 1,025,306** (SKIN-SECRET), **same; Reg. No. 1,089,285** (VALMOR 6 IN ONE), **same, filed** Aug. 18, 1978, D.C., N.D. Ill. (Chicago), Doc. 78C3323, *Valmor Products Co.* v. *Warner-Elektra-Atlantic Co., et al.* Cause dismissed with prejudice on May 23, 1980.

Reg. No. 997,433 (POLY-SPERSE), Betz Laboratories, Inc., **filed** June 15, 1982, D.C., S.D. Tex. (Houston), Doc. H-82-1637, *Betz Laboratories, Inc.* v. *Emco Chemical Co., Inc.*

Reg. No. 998,466. (See Reg. No. 636,452.)

Reg. No. 1,006,629. (See Reg. No. 724,764.)

Reg. No. 1,013,544. (See Reg. No. 915,734.)

Reg. No. 1,018,020. (See Reg. No. 636,452.)

Reg. No. 1,020,793 (DESIGN OF RABBIT HEAD), Playboy Enterprises, Inc., **filed** Aug. 11, 1981, D.C.N.J. (Camden), Doc. 81-2595, *Playboy Enterprises, Inc.* v. *Continental Key, Inc.* Order of Dismissal without costs and without prejudice filed June 28, 1982.

Reg. No. 1,021,070. (See Reg. No. 636,452.)

Reg. No. 1,025,306. (See Reg. No. 996,511.)

Reg. No. 1,026,740. (See Reg. No. 636,452.)

Reg. No. 1,028,681. (See Reg. No. 636,452.)

Reg. No. 1,030,146. (See Reg. No. 636,452.)

Reg. No. 1,032,316. (See Reg. No. 636,452.)

Reg. No. 1,036,813. (See Reg. No. 636,452.)

Reg. No. 1,040,510. (See Reg. No. 636,452.)

Reg. No. 1,041,215. (See Reg. No. 724,764.)

Reg. No. 1,043,517. (See Reg. No. 636,452.)

Reg. No. 1,045,985 (OP AND DESIGN), Ocean Pacific Sunwear, Inc., **filed** Aug. 7, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81-4009-LEW, *Ocean Pacific Sunwear, Inc.* v. *Andrew DeKovner, et al.*

Reg. No. 1,047,045. (See Reg. Nos. 724,764 and 859,314.)

Reg. No. 1,049,343 (DESIGN MISCELLANEOUS), Hachel International Co., Establishment; **Reg. No. 1,050,119** (WINGED DESIGN), **same; Reg. No. 1,058,847** (DESIGN MISCELLANEOUS), **same; Reg. No. 1,058,848** (DESIGN WITH FIGURES OF TWO CHILDREN), **same; Reg. No. 1,058,849** (DESIGN WITH FIGURE OF RUNNING MAN), **same; Reg. No. 1,058,850** (SUNBURST DESIGN), **same, filed** Dec. 16, 1981, D.C., S.D.N.Y., Doc. 81-Civ-7832 CBM, *Hachel International Co.* v. *Nicos Mouyaris.* Stipulation and Order of Discontinuance filed May 25, 1982.

Reg. No. 1,050,119. (See Reg. No. 1,049,343.)

Reg. No. 1,050,722. (See Reg. No. 984,005.)

Reg. No. 1,053,873. (See Reg. No. 984,005.)

Reg. No. 1,058,847. (See Reg. No. 1,049,343.)

Reg. No. 1,058,848. (See Reg. No. 1,049,343.)

Reg. No. 1,058,849. (See Reg. No. 1,049,343.)

Reg. No. 1,058,850. (See Reg. No. 1,049,343.)

Reg. No. 1,067,233. (See Reg. No. 636,452.)

Reg. No. 1,067,651. (See Reg. No. 984,005.)

Reg. No. 1,067,698. (See Reg. No. 984,005.)

Reg. No. 1,067,743. (See Reg. No. 984,005.)

Reg. No. 1,068,149. (See Reg. No. 636,452.)

Reg. No. 1,078,330 (BUCK STOVE), Cebu Corp.; **Reg. No. 1,186,577** (BUCK STOVE AND DESIGN), **same, filed** June 1, 1982, D.C., M.D.N.C. (Greensboro), Doc. C-82-645-WS, *Buck Stove Corp.* v. *Joseph H. Brown.*

Reg. No. 1,081,795 (GIORGIO ARMANI), Giorgio Armani, S.p.A., **filed** May 20, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82-2495 WMB (Bx), *Codefine, S.A. & Giorgio Armani, S.p.A.* v. *Colon.*

Reg. No. 1,084,409. (See Reg. No. 75,365.)

Reg. No. 1,086,395 (BOTTEGA VENETA), Bottega Veneta, Inc., **filed** Mar. 23, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 1414 WMB, *Bottega Veneta, Inc.* v. *RHM Marketing Co., Inc., et al.* Permanent Injunction filed May 12, 1982.

Reg. No. 1,089,285. (See Reg. No. 996,511.)

Reg. No. 1,089,942. (See Reg. No. 915,734.)

Reg. No. 1,092,544 (CUTTERY), Creative Hairdressers, Inc.; **Reg. No. 1,095,509** (THE HAIR CUTTERY), **same, filed** May 28, 1982, D.C. Md. (Baltimore), Doc. B-82-1438, *Creative Hairdressers, Inc., doing business as The Hair Cuttery* v. *Dana Elmo, doing business as Clarks Lane Hair Cuttery.*

Reg. No. 1,093,131. (See Reg. No. 758,839.)

Reg. No. 1,093,346 (ANIMALS NATURALLY), Irwin Fleminger, **filed** May 20, 1982, D.C., S.D.N.Y., Doc. 82-Civ-3288 GLG, *Irwin Fleminger* v. *Fable Toy Co., Inc., et al.*

Reg. No. 1,095,509. (See Reg. No. 1,092,544.)

Reg. No. 1,096,110 (JORDACHE), Jordache Enterprises, Inc., **filed** Feb. 13, 1981, D.C., S.D.N.Y., Doc. 81-Civ-850 PNL, *Jordache Enterprises, Inc.* v. *S.R. & W. Knitwear, Inc., et al.* Defendants permanently enjoined from further infringing Plaintiff's trademark. Filed Feb. 17, 1982. **Same, filed** Apr. 15, 1982, D.C., S.D.N.Y., Doc. 82-Civ-2375 (HFW), *Jordache Enterprises, Inc.* v. *Missprints, Ltd., et al.* **Same, filed** Dec. 22, 1981, D.C., S.D.N.Y., Doc. 81-Civ-7952 (WCC), *Jordache Enterprises, Inc.* v. *Robetown Robes, Inc., doing business as Karla Fashions & Korvette Kottons, et al.* Action discontinued without costs to either party, on May 26, 1982. **Same, filed** June 17, 1982, D.C., S.D. Calif. (San Diego), Doc. 82-0733-G(H), *Jordache Enterprises, Inc.* v. *Squire of Calif.*

Reg. No. 1,098,333 (I.M.M.), Chicago Mercantile Exchange; **Reg. No. 1,118,427** (INTERNATIONAL MONETARY MARKET), **same, filed** June 7, 1982, D.C., N.D. Ill. (Chicago), Doc. 82C3541, *Chicago Mercantile Exchange* v. *H.K., James & Co., Inc.*

Reg. No. 1,101,539. (See Reg. No. 75,365.)

Reg. No. 1,104,820. (See Reg. No. 636,452.)

Reg. No. 1,105,850 (DESIGN MISCELLANEOUS), Binney & Smith, Inc., **filed** Mar. 22, 1982, D.C., N.D. Tex. (Dallas), Doc. CA3-82-0434R, *Binney & Smith, Inc.* v. *Alfred W. Zlogar, et al.* Defendants are enjoined and restrained from further infringing Plaintiff's trademark. Filed June 21, 1982.

Reg. No. 1,108,987. (See Reg. No. 75,365.)

Reg. No. 1,108,988. (See Reg. No. 75,365.)

Reg. No. 1,117,301. (See Reg. No. 870,475.)

Reg. No. 1,118,099. (See Reg. No. 636,452.)

Reg. No. 1,118,427. (See Reg. No. 1,098,333.)

Reg. No. 1,120,400. (See Reg. No. 636,452.)

Reg. No. 1,122,860. (See Reg. No. 636,452.)

Reg. No. 1,127,288 (THE REAL ESTATE EXPRESS), S.G.S. Real Estate Co., Inc., **filed** Nov. 10, 1981, D.C., S.D. Calif. (San Diego), Doc. 81-1137-T(H), *The Real Estate Express, Inc.* v. *Danny F. Stovall, doing business as The Realty Estate Express.* Defendant is permanently enjoined from infringing Plaintiff's trademark. Filed May 25, 1982.

Reg. No. 1,134,811 (MILITARY RENT-ALL AND DESIGN), United Rent-All, Inc., **filed** June 15, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 2981, *Military Rent-All, Inc.* v. *William J. Holt.*

Reg. No. 1,139,464. (See Reg. No. 870,475.)

Reg. No. 1,139,987. (See Reg. No. 972,668.)

Reg. No. 1,140,123 (ATHAN'S VILLAGE), Athan's Village, Inc., **filed** May 15, 1981, D.C., N.D. Ohio (Toledo), Doc. C81-325, *Athan's Village, Inc.* v. *The Greek Village Restaurant, et al.* Notice of dismissal without prejudice filed June 1, 1981.

Reg. No. 1,144,568. (See Reg. No. 870,475.)

Reg. No. 1,159,134 (SILHOUETTE), Gulf & Western Corp.; **Reg. No. 1,170,161** (SILHOUETTE ROMANCE AND DESIGN), **same, filed** Mar. 26, 1982, D.C. S.D.N.Y., Doc. 82-Civ-1910, *Gulf & Western Corp.* v. *Sharon Publications, Inc., et al.* Final Judgment and Injunction on Consent filed May 20, 1982.

Reg. No. 1,161,160 (BOMBER), American Submarine, **filed** Apr. 16, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 2316, *Americana Submarine, Inc.* v. *Andy Lavato, et al., doing business as Piasano's Pizza & Bomber Shop.* Defendants permanently restrained and enjoined from further infringing Plaintiff's trademark. Filed June 11, 1982.

Reg. No. 1,161,848 (KULL), Morris and Kuykendall, **filed** June 23, 1982, D.C., S.D.N.Y., Doc. 82-Civ-4111 PNL, *Kull Productions, Inc.* v. *Krull Productions.*

Reg. No. 1,170,161. (See Reg. No. 1,159,134.)

Reg. No. 1,183,294. (See Reg. No. 783,371.)

Reg. No. 1,186,577. (See Reg. No. 1,078,330.)

Reg. No. 1,192,877 (KOENIG ART EMPORIUM), Art Management Services, Inc., **filed** June 2, 1982, D.C.N.J. (Newark), Doc. 82-1738, *Art Management Services, Inc.* v. *Art Emporium, Inc.*

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 2

[Docket No. 2512-96]

Trademark Applications and Examination Proceedings; Trademark Interference, Concurrent Use, Opposition and Cancellation Proceedings; Trademark Post-Registration Proceedings

Correction

In FR Doc. 82-17525, appearing as Part VI, at page 28324, in the issue of Tuesday, June 29, 1982, make the following changes:

1. On page 28324, in the second column, the fourth paragraph, the forth line, change "in" to "of";

2. On page 28324, in the third column, the sixth paragraph, the first line, change "2.83" to "2.88". In the same paragraph, line five, change "July 19," to "July 29,";

3. On page 28326, in the second column, the fifth paragraph, the first line, change "2.1120" to "2.120";

4. On page 28328, in the second column, the sixth paragraph, the first line, change "2.142" to "2.146";

5. On page 28328, in the third column, the fifth paragraph, the first line, change "2.145" to "2.165";

6. On page 28328, in the third column, the sixth paragraph, the first line, change "2.145" to "2.165";

7. On page 28329, in the second column, change the last word of the Part Heading from "COVERS" to "CASES";

8. On page 28329, in the third column, in §2.63(a), the sixth line, change "requirements" to requirement";

9. On page 28331, in the first column, §2.99(c), the first line should read "(c) ►Upon receipt of the copies required by";

10. On page 28334, in the second column, §2.120(b), line 17, change "of Rule" to "or Rule";

11. On page 28334, in the second column, §2.120(c), the first line, change "disposition" to "deposition";

12. On page 28334, §2.120(c)(2), the 25th line, change "39" to "30";

13. On page 28336, in the second column, §2.121(a)(2), the third line, remove the word "no";

14. On page 28336, in the second column, §2.121(b)(1) should as follows:

►(b) (1) The Trademark Trial and Appeal Board will schedule a testimony period for the plaintiff to present its case in chief, a testimony period for the defendant to present its case and to meet the case of the plaintiff, to present evidence in rebuttal.

15. On page 28336, in §2.121(b)(2) in the 20th line, change "representing" to "presenting";

16. On page 28336, in the second column, in §2.121, paragraph (c) should read as follows:

► (c) A testimony period which is solely rebuttal will be set for fifteen days. All other testimony periods will be set for thirty days. The periods may be extended by stipulation of the parties, approved by the Trademark Trial and Appeal Board, or, upon motion, by order of the Board.

17. On page 28338, in the second column, in §2.124 (d)(2), Line 13, change "be" to "by";

18. On page 28338, in the third column, in §2.124(e), the 8th line, change "office" to "officer";

19. On page 28338, in the third column, change the second heading for §2.125 to read as follows:

§2.125 ►Filing and Service◄ [Copies] of testimony.

20. On page 28339, in the third column, in §2.128(b), remove the third sentence;

21. On page 28339, in the third column, in §2.129(b), the first sentence, change "of time" to "or time".

22. On page 28340, in the first column, in §2.131, in line 31, change "to" to "of";

23. On page 28340, in the first column, in §2.132(a), line 8, change "more" to "move";

24. On page 28340, in the second column, in §2.132(b), the first line, change "of" to "or";

25. On page 28340, in the third column, in §2.134(b), the last line, change "be" to "by";

26. On page 28342, in the first column, in §2.165(a)(1), in the second line, change "2.612" to "2.162".

BILLING CODE 1505-01-M

PATENT NOTICES

Certificates of Correction for the Week of Aug. 24, 1982

Re. 30,597	4,275,013	4,319,383	4,329,980
Re. 30,891	4,275,256	4,319,446	4,330,273
Des. 264,161	4,278,288	4,319,950	4,330,537
Des. 264,316	4,279,717	4,320,240	4,330,579
Des. 264,802	4,281,300	4,320,348	4,330,661
3,700,328	4,282,541	4,320,501	4,330,836
3,982,207	4,282,905	4,320,507	4,330,892
3,983,028	4,283,721	4,320,998	4,330,922
4,007,848	4,285,738	4,321,270	4,331,057
4,054,539	4,288,759	4,321,999	4,331,517
4,138,577	4,290,665	4,322,176	4,331,605
4,151,068	4,292,314	4,322,225	4,331,694
4,180,336	4,292,457	4,322,574	4,331,713
4,180,856	4,292,700	4,322,676	4,331,753
4,185,166	4,292,749	4,322,905	4,331,990
4,210,451	4,292,920	4,323,067	4,332,041
4,211,972	4,293,229	4,324,298	4,332,256
4,212,857	4,293,429	4,324,645	4,332,681
4,215,054	4,296,220	4,325,145	4,333,203
4,215,536	4,296,786	4,325,220	4,333,402
4,223,108	4,297,697	4,325,464	4,333,569
4,224,576	4,299,808	4,325,723	4,333,640
4,228,221	4,300,852	4,325,882	4,333,914
4,229,620	4,301,469	4,325,958	4,333,966
4,229,718	4,303,150	4,326,201	4,334,029
4,230,609	4,303,943	4,326,213	4,334,191
4,230,726	4,305,914	4,326,247	4,334,388
4,232,123	4,306,462	4,326,261	4,334,583
4,234,897	4,306,774	4,326,961	4,334,745
4,236,003	4,307,179	4,327,010	4,334,756
4,238,313	4,308,388	4,327,366	4,334,829
4,238,486	4,309,089	4,327,378	4,334,939
4,240,897	4,309,092	4,327,441	4,335,050
4,240,918	4,310,006	4,327,492	4,335,149
4,243,708	4,311,102	4,327,814	4,335,274
4,246,482	4,311,606	4,328,085	4,335,328
4,247,318	4,311,618	4,328,132	4,335,610
4,252,966	4,311,884	4,328,592	4,335,756
4,255,505	4,311,920	4,328,614	4,335,835
4,256,809	4,312,381	4,328,865	4,336,193
4,256,840	4,313,973	4,329,151	4,336,300
4,257,371	4,314,754	4,329,275	4,336,434
4,258,871	4,315,063	4,329,510	4,336,450
4,259,484	4,316,253	4,329,530	4,336,484
4,261,567	4,316,360	4,329,554	4,337,103
4,272,864	4,317,717	4,329,575	4,337,399
4,274,882	4,319,257	4,329,623	

Disclaimers

3,796,048.—*Imre Annus, Gyula Cser, Sandor Florian, Gyorgy Horvath & Ferenc Kocsis,* Budapest, Hungary. TURBOCHARGED INTERNAL COMBUSTION ENGINE WITH RESONANCE INDUCTION PIPE SYSTEM. Patent dated Mar. 12, 1974. Disclaimer filed July 20, 1982, by the assignee, *Autoipari Kutato Intezet and Csepel Autogyar.*

Hereby enters this disclaimer to claims 1 and 4 of said patent.

4,127,588.—*Henri Ramuz,* Birsfelden, Switzerland. SULPHUR CONTAINING DERIVATIVES. Patent dated Nov. 28, 1978. Disclaimer filed May 10, 1982, by the assignee, *Hoffmann-La Roche, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

4,136,160.—*Steven R. Coh,* Baltimore, Md. SPECIFIC ASSAY FOR ACTIVE DEMYELINIZATION. Patent dated Jan. 23, 1979. Disclaimer filed June 28, 1982, by the inventor.

Hereby enters this disclaimer to claims 1 through 4 of said patent.

4,220,052.—*Jerome F. Sheldon,* Milwaukee, Wis. PIN RETENTION BY INTERFERENCE FIT DIFFERENTIAL. Patent dated Sept. 2, 1980. Disclaimer filed June 14, 1982, by the assignee, *Rexnord, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,237,238.—*David T. De Gutseppi,* Wallingford, and *Richard A. Kolakowski,* Northford, Conn. POLYISOCYANURATE FOAMS BASED ON ESTERIFIED DMI OXIDATION RESIDUE ADDITIVE. Patent dated Dec. 2, 1980. Disclaimer filed June 28, 1982, by the assignee, *The Upjohn Co.*

Hereby enters this disclaimer to claims 1 through 7 inclusive of said patent.

4,301,968.—*Harvey L. Berger,* Poughkeepsie, and *Charles R. Brandow,* Highland, N.Y. TRANSDUCER ASSEMBLY, ULTRASONIC ATOMIZER AND FUEL BURNER. Patent dated Nov. 24, 1981. Disclaimer filed June 29, 1982, by the assignee, *Sono-Tek Corp.*

The term of this patent subsequent to May 8, 1996 has been disclaimed.

4,310,868.—*James B. Lillie,* Longmont, and *James L. Sanford,* Boulder, Co. FAST CYCLING, LOW POWER DRIVER FOR AN ELECTROMAGNETIC DEVICE. Patent dated Jan. 12, 1982. Disclaimer filed June 30, 1982, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to all claims of said patent.

Dedication

4,260,467.—*John L. Smith,* Mercerville, and *Bruce N. Whitlock,* Princeton, N. J. STATIC DROP MERCURY ELECTRODE. Patent dated Apr. 7, 1981. Dedication filed Apr. 22, 1982, by the assignee, *Princeton Applied Research Corp.*

Hereby dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 26, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-20-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-05-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-11-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	6-30-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-30-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director .... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-26-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-02-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	7-25-80

Expiration of patents: The patents within the range of numbers indicated below expire during June 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,186,004 to 3,192,535, inclusive

Plant Patents ..... Numbers 2,522 to 2,542 inclusive

REISSUES

AUGUST 24, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

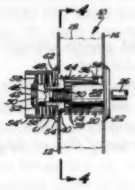
Re. 31,015
REEL ADAPTER FOR TIE MATERIAL AND METHOD OF USING SAME

Doyle A. Moore, Worthington, Minn., assignor to Bedford Industries, Inc., Worthington, Minn.

Original No. 4,117,988, dated Oct. 3, 1978, Ser. No. 678,923, Apr. 21, 1976. Application for reissue Sep. 22, 1980, Ser. No. 189,378

Int. Cl.[3] **B65H** *75/18, 75/22*

U.S. Cl. 242—71.9 **17 Claims**



1. A reel adapter for supporting a coil of tie material, said adapter comprising a *tube having about it a* tubular body member generally in the form of a cylinder, a flange member located at each end of the tubular body member, the flange members being parallel and oriented normal to the axis of the tube, fastening means for removably securing at least one of the flanges on the tube so that the coil of tie material can be placed on the adapter and the removable flange replaced and said adapter having means thereon for engaging the wound coil of tie material to the adapter to prevent rotation of the tie material on the adapter, said [tube] *tubular body member* comprising an expandable collet having a plurality of longitudinally extending circumferentially spaced segments with notches between them, the segments being free at one end and integrally connected at the other end and a collet [expanding means] *expander* operatively associated with the free ends of the segments to press the segments outward when the removable flange is moved in the direction of the other flange, *said means for engaging the wound coil of tie material to the adapter comprising said expandable collet of said tubular body member,* and the adapter includes a means *thereupon* for retaining the removable flange and collet [expanding means thereupon] *expander operably connected as a single removable assembly.*

Re. 31,016
ANTI-FRICTION SUCKER ROD GUIDE ASSEMBLY

Clarence Oster, Pecos, Tex., assignor to Conoco Inc., Ponca City, Okla.

Original No. 4,182,537, dated Jan. 8, 1980, Ser. No. 912,605, Jun. 5, 1978. Continuation-in-part of Ser. No. 784,098, Apr. 4, 1977, abandoned. Application for reissue Dec. 22, 1980, Ser. No. 218,599

Int. Cl.[3] **F16C** *29/00*

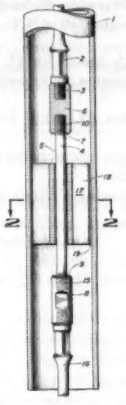
U.S. Cl. 308—4 A **8 Claims**

1. An anti-friction sucker rod coupling and guide apparatus comprising in combination:

(a) an elongated polished rod member having a long axis, a standard male fitting on each end, and a polished [brass] *metal* anti-friction surface along its cylindrical length;

(b) a rod box having a shoulder perpendicular to the long axis of the rod member affixed at each end of the rod member for attaching the rod member within a sucker rod string such that the shoulders of the rod boxes form abutments encircling the rod member at each end;

(c) an elongated rod guide, fabricated of an anti-friction organic polymer having an inner bore along its long axis having a smooth surface contacting the polished [brass] *metal* anti-friction surface of the rod member, which is slideably positioned about the rod member, the rod guide having an outer diameter sufficient to functionally contact the inner diameter of a tubing string in which the rod guide is positioned, the rod guide including passageways



sufficient to permit passage of produced fluid therethrough, the rod guide having a shoulder perpendicular to the long axis of its inner bore at each of its ends adapted for abutment against the shoulders of the rod boxes affixed at each end of the rod member; the rod boxes adapted to maintain the rod guide on the rod member without deformation.

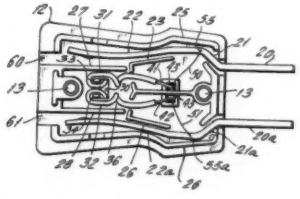
Re. 31,017
METHOD FOR FUSING MALE PLUG AT END OF POWER LINE CORD

Elliot Bernstein, Rockville Centre, N.Y., assignor to Bel Fuse Inc., Jersey City, N.J.

Original No. 4,176,902, dated Dec. 4, 1979, Ser. No. 846,036, Oct. 27, 1977. Application for reissue Mar. 31, 1980, Ser. No. 135,331

Int. Cl.[3] **H01H** *85/12;* **H01R** *13/68*

U.S. Cl. 339—147 P **3 Claims**



4. [The fused plug of claim 1 wherein the wires of said line cord are stranded wires and wherein the fuse link comprises at least one selected strand of said wire] *A fused plug comprising a housing;*

a pair of prongs mounted in said housing and having substantially parallel extensions outside said housing;

an opening in said housing;

a line cord extending through said opening into said housing;

said line cord comprising a pair of wires, said wires being stranded wires and each said wire being in electrical contact with a respective one of said prongs; and

a fuse link between the end of at least one of said wires and one of said prongs adjacent said wire, said fuse link comprising at least one selected strand of said wire.

Re. 31,018

METHOD AND APPARATUS FOR SHIELDING THE EFFLUENT FROM PLASMA SPRAY GUN ASSEMBLIES

John H. Harrington, Warwick; Richard T. Smyth, and John D. Weir, both of Huntington, all of N.Y., assignors to Metco Inc., Westbury, N.Y.

Original No. 4,121,082, dated Oct. 17, 1978, Ser. No. 791,478, Apr. 27, 1977. Application for reissue Nov. 13, 1980, Ser. No. 206,589

Int. Cl.[3] **B23K** *9/00*

U.S. Cl. 219—121 PL **47 Claims**

1. A plasma spray gun assembly for coating substrates comprising, in combination:

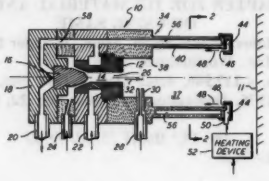
a nozzle electrode having a nozzle passage therethrough;

a rear electrode;

means for passing plasma-forming gas through the nozzle electrode;

means for passing an arc-forming current between said electrodes to form a plasma effluent;

means for introducing spray coating material into the plasma effluent;



a wall shroud for said plasma effluent extending from the exit of the nozzle electrode; and

means for forming a hot gas shroud for said plasma effluent at least within the wall shroud *directed at an angle such that the gas has a component of flow extending in a direction opposite to the direction of flow of the plasma effluent.*

PLANT PATENTS

GRANTED AUGUST 24, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,879

LILY PLANT: LILIUM 'MATCHLESS'

Edward A. McRae, 36752 SE. Bluff Rd., Boring, Oreg. 97009

Filed Oct. 27, 1980, Ser. No. 200,970

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its rapid natural propagation in field cultivation, by its vigorous growth when forced under glass, by its resistance to disease and virus, by its broad leaves, and in particular by the brilliant orange, unspotted color of its upright flowers.

4,880

LILY NAMED ESCORT

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Dec. 11, 1980, Ser. No. 215,535

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental Hybrid lily plant substantially as herein shown and described, characterized by its very large, brilliantly colored flowers borne on strong, stiff, upwardly-projecting pedicels, by its short and compact pot growth habit, and by its dark green, glossy foliage.

4,881

LILY NAMED LAURA

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Dec. 11, 1980, Ser. No. 215,234

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental Hybrid lily plant substantially as herein shown and described, characterized by its large, upwardly and outwardly facing flowers borne on strong stiff pedicels, by the substantially overall rosy pink coloring of the sepals and petals which are bordered by a frilly marginal band of white, and by the profuse production of flowers which have a long lasting quality whether on the plant or as cut flowers.

PATENTS

GRANTED AUG. 24, 1982

ERRATA

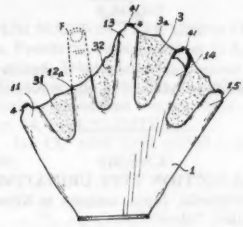
For CLASS	See PATENT NO.
412–005	4,345,349
279–062	4,345,445
374–020	4,345,455
374–106	4,345,470
374–188	4,345,471
524–219	4,346,024
524–141	4,346,025
524–157	4,346,026
524–377	4,346,027
524–417	4,346,028
549–302	4,346,038
549–289	4,346,039
549–505	4,346,040
549–498	4,346,041
549–557	4,346,042
373–137	4,346,252
378–110	4,346,297
005–441	4,346,298
378–024	4,346,299
206–455	4,346,300
369–044	4,346,471

PATENTS

GRANTED AUGUST 24, 1982

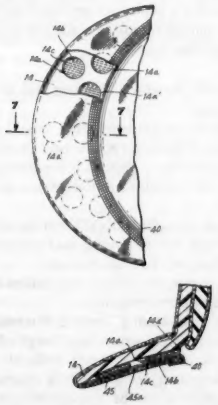
GENERAL AND MECHANICAL

4,345,335
WEBBED GLOVE FOR SWIMMING USE
Chao Shih-Li, 10-4 Fl., No. 62, Chang Chun Rd., Taipei, Taiwan
Filed Jun. 16, 1980, Ser. No. 159,820
Int. Cl.[3] A41D *19/00;* **A63B** *31/02*
U.S. Cl. 2—161 A **3 Claims**



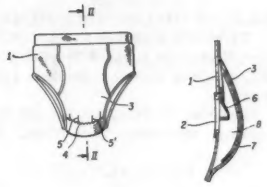
1. A webbed swimming glove comprising:
a plurality of sheaths each defining a sheath cavity for accommodating a digit on a hand, each of said sheaths including an end portion terminating in an elongated sheath tip extending away from said end portion and defining an elongated aperture substantially smaller in cross-section than said sheath-cavity; and
a web attached to each adjacent pair of said sheaths.

4,345,336
HEAD PROTECTING HEADWEAR
Mario A. Plastino, 659 Mastic Rd., Mastic, Long Island, N.Y. 11950
Continuation-in-part of Ser. No. 25,479, Mar. 30, 1979, abandoned. This application Jan. 25, 1980, Ser. No. 115,392
Int. Cl.[3] A42B *1/18, 3/00*
U.S. Cl. 2—187 **20 Claims**



1. Headwear for protecting the head of a wearer comprising:
a resilient shell having a crown portion, a head receiving opening defined at the bottom of the crown portion, and a peak extending downwardly and outwardly from the head receiving opening at the front of said shell;
cushioning means disposed within said shell for cushioning the head of a wearer;
a removable cover generally shaped to conform to the contour of said shell, said cover including an opening for receiving said shell, a crown portion for fitting over the crown of said shell, a peak portion for receiving the peak of said shell, and elastic means for positioning and securing said cover in place over said shell; and
means for removably connecting the peak of said shell to the peak portion of said cover, such that said connecting means and said elastic means coact to snugly secure said cover to said shell and prevent slippage thereof.

4,345,337
MAN'S BRIEFS
Seun Y. Chung, 1102 Shinrim 8-dong, Kwanak-ku, Seoul, Rep. of Korea
Filed Aug. 19, 1980, Ser. No. 179,482
Int. Cl.[3] A41B *9/02*
U.S. Cl. 2—405 **2 Claims**

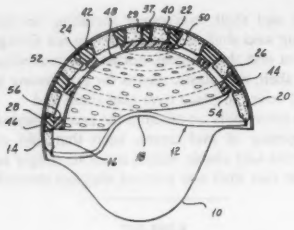


1. Briefs for the support of male genetalia, said genetalia including a penis and a seminal vesicle, said briefs having an opening formed therein for the passage of said genetalia and comprising:
a cover member attached to said briefs and located adjacent said opening formed in said briefs, said cover member and said briefs forming a space for the placement of said genetila;
a band-type ring for support of said penis attached to an upper portion of said opening formed in said briefs, said ring having a lower arcuate supporting surface disposed substantially perpendicular to said opening for supporting said penis such that said penis is separated from and prevented from contacting said seminal vesicle;
a coarse rubbing cloth attached to an interior portion of said cover member such that said rubbing cloth rubs said penis and dulls the senses of said penis; and
a plurality of wrinkles formed on a bottom portion of said cover.

4,345,338
CUSTOM-FITTED HELMET AND METHOD OF MAKING SAME
Leonard P. Frieder, Jr., Dalton, and Michael R. Lavender, Vandling, both of Pa., assignors to Gentex Corporation, Carbondale, Pa.
Filed Oct. 5, 1979, Ser. No. 82,296
Int. Cl.[3] A42B *3/00, 3/02*
U.S. Cl. 2—414 **3 Claims**

1. A custom-fitted helmet assembly including in combination a sealed elastomer sack having opposed convex and concave surface portions generally conforming to the top of a wearer's head and containing a rigidified resin composite, said resin composite having been rigidified in situ by placement of said sack over the wearer's head after mechanical deformation of said sack to initiate rigidification, a rigid outer shell secured to said convex surface portion of said sack, and an inner helmet assembly adapted to fit over the wearer's head, said sack being

formed with recesses in said concave surface portion, said inner helmet assembly having resilient portions received by



said recesses and energy-absorbing portions disposed between said resilient portions and the wearer's head.

4,345,339

BIOLOGICALLY IMPLANTABLE MEMBER FOR A TENDON AND/OR LIGAMENT

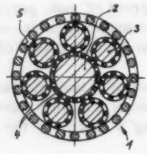
Arnold Müller, Bachs, and Gerhard Bröckel, Seuzach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 19, 1981, Ser. No. 265,067

Claims priority, application Switzerland, Jun. 3, 1980, 4278/80

Int. Cl.³ A61F *1/24*

U.S. Cl. 3—1 **12 Claims**



1. A biologically implantable member for tendons and ligaments comprising

at least one rope having a core filament; a first tube encasing said filament therein in relatively longitudinally movable relation; at least one ring of outer filaments surrounding said first tube and said core filament, each said outer filament being of smaller diameter than said core filament; a plurality of tubes, each said tube encasing a respective outer filament therein in relatively longitudinally movable relation; and a cover encircling said ring whereby said rope has an outwardly increasing bending elasticity from said core filament.

4,345,340

STENT FOR MITRAL/TRICUSPID HEART VALVE

Jonathan J. Rosen, Fountain Valley, Calif., assignor to Vascor, Inc., Anaheim, Calif.

Filed May 7, 1981, Ser. No. 261,392

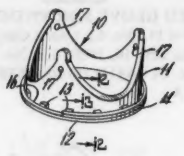
Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **16 Claims**

1. A stent for a trileaflet heart valve comprising

a body portion of a cylindrical section terminating at one end in three circumferentially-spaced commissure posts and at the other end in a flange extending radially outward from the base of said cylindrical section;

said flange including an annulus of reduced thickness defining a channel adjacent the base of said cylindrical section;



said channel being interrupted by a plurality of spaced, radially-extending, reinforcing ribs traversing said channel.

4,345,341

VACUUM SUCTION TYPE URINATING AID

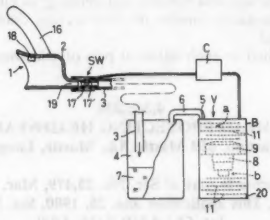
Shuichi Saito, Funabashi, Japan, assignor to Kimura Bed Mfg. Company Limited, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,883

Claims priority, application Japan, Apr. 25, 1980, 55-57026; Apr. 25, 1980, 55-57027

Int. Cl.³ A61F *5/44*; A61M *1/00*; F01M *1/10*

U.S. Cl. 4—301 **5 Claims**



1. A vacuum suction type urinating aid comprising:

a urine receiver having a urine suction opening adapted to be applied to the urinating region of a subject to receive therefrom urine and a urine outlet;

a urine tank;

a urine transport tube connected between said urine outlet and said urine tank; and

vacuum suction device means connected to said urine tank for creating a vacuum to form an air current drawing any urine in said urine receiver through said urine transport tube into said urine tank, said vacuum suction device means comprising:

a casing having at opposite ends thereof an inlet connected to said urine tank for receiving said air current and an outlet for discharging said air current;

said casing being formed by two casing halves divided longitudinally of said opposite ends;

each said casing half having formed internally thereof a plurality of transversely extending, longitudinally spaced grooves, each said groove being defined by a pair of transversely extending, longitudinally spaced protrusions extending inwardly from the respective said casing half;

a suction motor including an impeller for creating said air current;

a partition and support plate supporting said motor, said partition and support plate fitting within respective said grooves in said casing halves with said casing halves joined together, such that an air passage extends through said casing from said inlet, through said impeller to said outlet;

a first plurality of silencing partition plates fitting within

respective said grooves of said casing halves between said inlet and said impeller;

a second plurality of silencing partition plates fitting within respective said grooves of said casing halves between said impeller and said outlet; and

said silencing plates altering the direction of said air passage and diverting the path of said air current through said casing, thereby reducing the level of noise generated from said vacuum suction device means.

4,345,342

VACUUM SUCTION TYPE URINATING AID

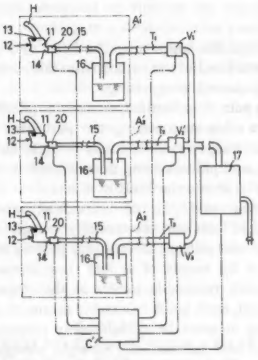
Shuiichi Saito, Funabashi, Japan, assignor to Kimura Bed Mfg. Company Limited, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,884

Claims priority, application Japan, Mar. 14, 1980, 55-33372[U]; Mar. 14, 1980, 55-33373[U]

Int. Cl.³ A61F *5/44*; A61M *1/00*

U.S. Cl. 4—301 **2 Claims**



1. A vacuum suction type urinating aid capable of simultaneous use by plural subjects, said aid comprising:

a plurality of urine suction units capable of simultaneous use by different subjects, each said unit including a urine receiver having a urine suction opening adapted to be applied to the urinating region of a particular subject to receive therefrom urine, an air suction opening separate from said urine suction opening, and a urine outlet, a urine tank, and a urine transport tube connected between said urine outlet and said urine tank;

a plurality of vacuum suction tubes, each said vacuum suction tube having a first end connected to an upper portion of a respective said urine tank and a second end;

each said vacuum suction tube having therein a respective valve movable between a first position blocking the respective said vacuum suction tube and a second position opening said respective vacuum suction tube;

means, comprising a single vacuum suction device commonly connected to said second ends of all of said vacuum suction tubes, for, with respect to each said urine suction unit when the respective said valve is in said second position thereof, drawing air into the respective said urine receiver through said air suction hole therein and for drawing air and any urine in said respective urine receiver through the respective said urine outlet and urine transport tube into the respective said urine tank; and

each said urine suction unit including control means, connected to the respective said valve and to said single vacuum suction device, for selectively operating said single vacuum suction device and moving said respective valve from said first position thereof to said second position thereof, whereby when each said control means is not operated said respective valve is maintained in said first position thereof and, in the absence of operation of any other of said control means, said single vacuum suction device is stopped.

4,345,343

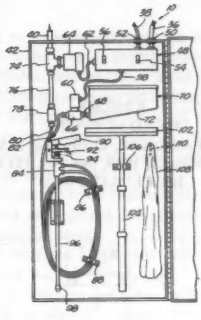
APPARATUS FOR THE CLEANING AND SANITATION OF A RESTROOM OR LAVORATORY

Matthew W. Shipman, 300 S. Westgate Ave., Los Angeles, Calif. 90049

Filed Sep. 2, 1980, Ser. No. 183,262

Int. Cl.³ A47K *4/00*

U.S. Cl. 4—662 **10 Claims**



1. An apparatus for cleaning and sanitizing a restroom facility having multiple sidewalls and a water line inside the restroom facility, the apparatus comprising,

a retrofitable housing,

means for securing said housing to at least one of said sidewalls of said restroom facility,

means for storing a cleaning solution, said storing means suspended within said housing,

first means for controlling water flow from said water line inside said restroom facility into said housing, second means for controlling cleaning solution flow from said storing means, said first and second controlling means contained within said housing,

a spray gun flexibly attached to said housing,

a mixing chamber adapted to receive said water flow and said cleaning solution flow, said mixing chamber disposed within said housing, said mixing chamber further adapted to direct said water flow and cleaning solution flow to said spray gun.

4,345,344

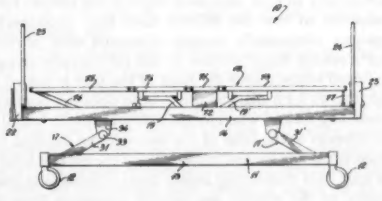
HOSPITAL BED

Andre Gadoury; Victor Pinheiro, both of Ste-Foy, and Martin Pernicka, Loretteville, all of Canada, assignors to Centre de Recherche Industrielle du Quebec, Ste-Foy, Canada

Filed Apr. 8, 1980, Ser. No. 138,554

Int. Cl.³ A61G *7/00*

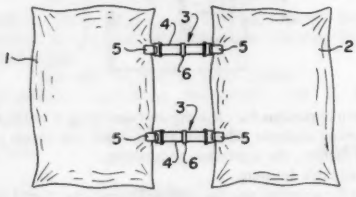
U.S. Cl. 5—62 **18 Claims**



1. A hospital bed comprising a base frame, a displaceable frame supported above said base frame by adjustable leg sup-

ports, said leg supports being connected in pair and spaced apart adjacent a respective end of said frames, said leg supports of each pair operating in unison and each having an upper link arm and a lower link arm, said link arms being connected at a common end to a fixed pivot rod for displacement of their axes thereabout, said pivot rod being fixed relative to said displaceable frame, first drive means connected to said adjustable leg supports for causing said displaceable frame to be displaced above said base frame, and follower means connected to a lower end of said leg supports to maintain said displaceable frame in lateral relationship with said base frame when displaced relative thereof.

4,345,345
HEAD SUPPORT
Leonard Holtz, 418 Jordan St., Oceanside, N.Y. 11572
Filed May 21, 1980, Ser. No. 151,908
Int. Cl.³ A47G 9/00
U.S. Cl. 5—437 **7 Claims**

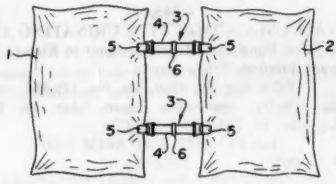


1. A head support arrangement for supporting the head of a user when the user is seated, comprising:

a pair of individual, separable, pillows (1,2), each pillow having an edge surrounding the periphery thereof which includes at least one substantially straight elongated edge, said pillows being dimensioned to extend from the shoulders to above the head of a user; and

connecting means including at least one connecting member (3) having quick releasable means (5) at the respective opposite ends thereof, said quick releasable means (5) each being releasably connected to said substantially straight elongated edge of a respective pillow so as to extend between said substantially straight elongated edges and connect the individual pillows together with a spacing between the interconnected substantially straight elongated edges of the respective pillows and with said connecting member located to be behind a head of a user when the head of a user is placed on the pillows in the vicinity of the spacing between the pillows, said connecting means spanning a distance in the longitudinal direction of said substantially straight elongated edge of each of said pillows which is substantially less than the length of said substantially straight elongated edges of the pillows being connected so that the pillows have free, unconnected opposing substantially straight elongated edge portions over a central major portion of said substantially straight elongated edges where the head of the user is placed on said pillows such that the user's head does not contact a connecting means, whereby the pillows provide lateral or side support to the head of the user without utilizing any means extending around to the front of the neck or head of the user, said connecting means being substantially small relative to the pillows and quickly releasable from the pillows without damaging the pillows to permit separation of the pillows.

4,345,346
HEAD SUPPORT
Leonard Holtz, 418 Jordan St., Oceanside, N.Y. 11572
Division of Ser. No. 151,908, May 21, 1980. This application Dec. 1, 1980, Ser. No. 211,841
Int. Cl.³ A47G 9/00
U.S. Cl. 5—437 **6 Claims**



1. A method for supporting the head of a person and for preventing the head of the person from falling to the side while the person is seated, comprising:

providing a pair of individual, separable, pillows, each pillow having an edge surrounding the periphery thereof which includes at least one substantially straight elongated peripheral edge, said pillows being dimensioned to extend from the shoulders to above the head of a user;

interconnecting said pair of individual, separable, pillows along said at least one substantially straight elongated edge of each of said pillows so that said pillows are spaced from each other by means of at least one connecting member having quick releasable means at the respective opposite ends thereof, each quick releasable means of said at least one connecting member being releasably connected to a small portion of said substantially straight elongated edge of a respective pillow so as to extend between said substantially straight elongated edges and to connect the individual pillows together with said spacing between opposing substantially straight elongated edges of the respective pillows, said small portion of said substantially straight elongated edges being substantially smaller than the lengths of said substantially straight elongated edges of said pillows; and

locating said interconnected, spaced pillows behind the head of the seated person with the person' head in the vicinity of the spacing between the pillows, with the pillows resting on the shoulders of the seated person and with said connecting member located behind but out of contact with the head of the user when the head of the user is placed on the pillows in the vicinity of said spacing between the pillows, the pillows being located such that the head of the user contacts the pillows in the vicinity of the central portion of said substantially straight elongated edge portions of the pillows;

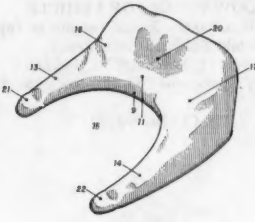
said at least one connecting member being substantially thinner in the direction perpendicular to the lengthwise direction thereof than the length of said substantially straight elongated edges of said pillows being connected together so that the pillows have free, unconnected opposing substantially straight elongated edge portions over a central major portion of said substantially straight elongated edges where the head of the user is placed on said pillows such that the user's head does not contact a connecting means, whereby the pillows provide lateral or side support to the head of the user without utilizing any means extending around to the front of the neck or head of the user, and said at least one connecting member being substantially small relative to the pillows and quickly releasable from the pillows without damaging the pillows to permit quick and easy separation of the pillows from each other after use.

4,345,347

HEAD AND NECK SUPPORT CUSHIONS

Philip A. Kantor, 224 Gregory Ave., West Orange, N.J. 07052

Filed Apr. 24, 1980, Ser. No. 143,425
Int. Cl.³ A47G 9/00
U.S. Cl. 5—441 1 Claim



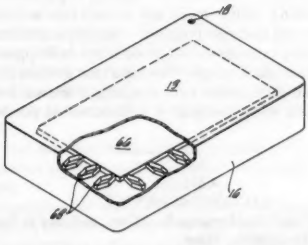
1. An inflatable head and neck support cushion in a modified "horseshoe" shape, designed to rest on the shoulders of a person relaxing or working in a semi-reclining position in any hospital bed, passenger seat or high-backed chair; such that the head and neck are received by the interior middle portion of the "horseshoe", such middle portion permanently embodying the contour of the back of the head and neck of a person, the two tips of the "horseshoe" being long enough to extend over the shoulders of the person and widely enough disposed apart from one another so that there is unrestricted circulation of air to the sides of the neck and face of the person, the "horseshoe" tips containing at their extremities tiny weights, slightly heavier than the inflated middle portion of the "horseshoe", in order to stabilize the entire cushion on the shoulders of a person.

4,345,348

WATERBED MATTRESS WITH A BAFFLE

Charles P. Hall, Muir Beach, Calif., assignor to Monterey Manufacturing, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 949,963, Oct. 10, 1978, Pat. No. 4,247,962. This application Nov. 19, 1979, Ser. No. 95,214
The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.
Int. Cl.³ A47C 27/08
U.S. Cl. 5—450 32 Claims



1. In a waterbed mattress having an enclosing structure comprising a horizontally extending top wall, a horizontally extending bottom wall, and side walls, the improvement comprising a horizontally extending baffle for reducing wave-like motion of water in the mattress disposed within the enclosing structure and vertically spaced apart from the bottom wall when the mattress is filled with water, the baffle having a horizontal extent corresponding generally to the sleeping surface of the mattress and permitting water to circulate between the top wall and the bottom wall.

4,345,349

ADHESIVE FOR PERFECT BOUND BOOKS AND METHOD OF USING SAME

Thomas P. Flanagan, Green Brook, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 30, 1981, Ser. No. 288,500
Int. Cl.³ B42C 9/02; C08L 91/06, 93/04
U.S. Cl. 412—5 7 Claims

1. A non-pressure sensitive hot melt adhesive composition comprising on a weight basis:

(1) 15–30% of at least one block polymer having the general configuration

A-B-A

wherein A is a non-elastomeric polymer block derived from the moieties of a monovinyl aromatic hydrocarbon radical and B is an elastomeric polymer block derived from the moieties of a conjugated diene monomer;

(2) 5–10% of at least one ethylene vinyl acetate copolymer containing 17 to 42% vinyl acetate, where the weight ratio of block polymer to ethylene vinyl acetate copolymer is within the range of 1.75:1 to 6:1;

(3) 25–40% of at least one rosin ester tackifier selected from the group consisting of glycerol and pentaerythritol esters of natural and modified rosins;

(4) 25–35% of at least one wax diluent which is solid at room temperature; and

(5) 0.5 to 3% of at least one stabilizer; said composition being characterized by an ability to form a film exhibiting Instron yield strengths of 100 to 250 psi. and a low temperature flexibility of less than 10° F., said composition having a melt viscosity of 3,000 to 30,000 cps. at 350° F. and being capable of setting up in less than 30 seconds and, when applied to roughened signatures using perfect binding techniques yielding a book having an adhesion page pull on coated stock of at least 10 pounds per page having a length of 7⅜ to 7¼ inches.

5. A method for binding books containing a plurality of sheets by means of the perfect binding method, the steps for producing a spine for said books comprising:

(A) securing the edges of such sheets and applying thereto a molten film of a hot melt non-pressure sensitive adhesive composition comprising on a weight basis:

(1) 15–30% of at least the block polymer having the general configuration

A-B-A

wherein A is a non-elastomeric polymer block derived from the moieties of a monovinyl aromatic hydrocarbon radical and B is an elastomeric polymer block derived from the moieties of a conjugated diene monomer;

(2) 5–10% of at least one ethylene vinyl acetate copolymer containing 17% to 42% vinyl acetate; where the weight ratio of the block polymer to the ethylene vinyl acetate copolymer is within the range of 1.75:1 to 6:1;

(3) 25–40% of at least one rosin ester tackifier selected from the group consisting of glycerol and pentaerythritol esters of natural and modified rosin,

(4) 25–35% of at least one wax diluent which is solid at room temperature; and

(5) 0.5 to 3% of at least one stabilizer; said film being characterized by an Instron yield strength of 100 to 250 psi., and a low temperature flexibility of less than 10° F., said composition having a melt viscosity of 3,000 to 30,000 cps. at 350° F. and a set up time of less than 30 seconds and, when applied to roughened signatures using perfect binding techniques yielding a book having an adhesion page pull on coated stock of at least 10 pounds per page having a length of 7⅜ to 7¼ inches;

(B) allowing said film to solidify.

4,345,350

PIPELINE CLEANING EQUIPMENT

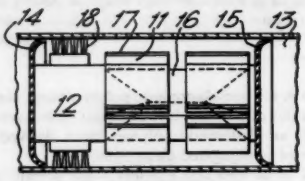
John F. Burd, Newcastle upon Tyne, England, assignor to British Gas Corporation, London, England

Filed Mar. 27, 1981, Ser. No. 248,353

Claims priority, application United Kingdom, Jan. 26, 1981, 8102288

Int. Cl.³ B08B 9/04

U.S. Cl. 15—104.06 R 7 Claims



1. A pig for the removal of ferromagnetic debris from the internal surface of a pipeline comprising magnetic pole generating means for generating a plurality of magnetic poles comprising blocks of hard ferromagnetic material, mounting means for said magnetic pole generating means to position said magnetic pole generating means adjacent to but spaced apart from the nominal position of the internal surface of the pipeline, spacer means contiguous with said mounting means to space magnetic poles of opposite polarity by a distance of the same order of magnitude as the spacing of said magnetic pole generating means from the nominal position of the internal surface of the pipeline.

4,345,351

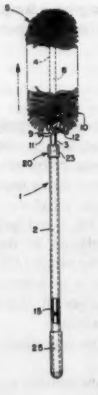
EXTENSION HANDLE FOR DUST MOPS AND THE LIKE

Theron C. Moss, Cleveland; Earl Boring, McDonald, and Jerry Hjellum, Cleveland, all of Tenn., assignors to SECO Industries, Inc., Cleveland, Tenn.

Filed Mar. 2, 1981, Ser. No. 239,501

Int. Cl.³ B25G 1/04

U.S. Cl. 15—144 B 11 Claims



1. An extension handle for dust mops and the like comprising an outer tubular member and an inner tubular member telescopically received in said outer tubular member, said inner and outer tubular members beiang axially movable relative to each other to vary the length of said extension handle, one of said tubular members having a protrusion thereon frictionally engaging the other tubular member to provide sufficient resistance to such relative axial movement to retain said extension handle in the desired adjusted position during use, and the other tubular member being made of relatively thin-walled plastic tubing to permit some deformation thereof according to the amount of interference between said protrusion and said other tubular member.

4,345,352

WINDOW WIPER FOR VEHICLE

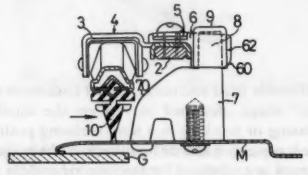
Gosaku Terabayashi, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 11, 1980, Ser. No. 186,266

Claims priority, application Japan, Sep. 15, 1979, 54-127100[U]

Int. Cl.³ B60S 1/04

U.S. Cl. 15—250.16 4 Claims



1. A window wiper for wiping the glass of a windshield of a vehicle comprising:

a wiper blade which is positioned along and adjacent the lower edge of said windshield glass when said wiper is stopped and at rest;

a wiper arm oscillational about a transverse axis at one end thereof;

a blade holder connected to the other end of said arm and rockably supporting the central portion of said wiper blade to that side of said arm which faces upwardly when said wiper is at rest;

a slide member fixedly mounted to said blade holder and having a portion on the other side of said arm projecting toward said windshield glass, that surface of said portion opposed to said glass being smooth and having a convexly curved edge which is lowermost when said wiper is at rest; and

a fixed guide member adjacent the lower edge of said windshield glass at a position engageable by said projecting portion when said wiper blade moves to its rest position, the surface of said guide member opposed to said projecting portion being inclined for camming engagement with said projecting portion to lift said wiper blade as the latter moves toward said rest position to minimize deformation of the wiping portion of said blade when in stopped position, and said guide member having a stop portion engageable by said slide member for stopping downward movement of said wiper blade at a predetermined position of rest

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4,345,353

FILTERING DEVICE

George L. Sommerfeld, Minneapolis, Minn., assignor to Tennant Company, Minneapolis, Minn.

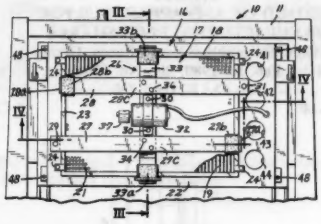
Continuation-in-part of Ser. No. 60,012, Jul. 23, 1979, Pat. No. 4,258,451. This application Nov. 24, 1980, Ser. No. 210,040

Int. Cl.³ B01D 46/04

U.S. Cl. 15—349 11 Claims

1. A sweeper comprising a body structure, a plurality of wheels supporting said body structure, and a sweeper housing, said body structure including a hopper, a vacuum pump and a dust filter, said hopper serving to store debris picked up by said sweeper, said vacuum pump serving to draw a partial vacuum in said sweeper housing thereby providing a moving airstream, said dust filter being disposed in said airstream to remove dust

particles from said airstream, said dust filter comprising a filter housing, a pleated planar filter medium, support means for said filter medium and a striker mechanism for removing accumulated dust from said filter medium, said striker mechanism including at least one strap, said strap having a first end secured with respect to said filter housing, said strap having a



second end which is free to move with respect to said filter housing and filter medium, said second end carrying at least one hammer, said strap and hammer overlying the upper edges of the pleated filter medium, and an oscillator supported on said strap intermediate said first and second ends for imparting movement to said strap and hammer to impart shock to said filter medium thereby removing dust accumulation.

4,345,354

HINGE MECHANISM

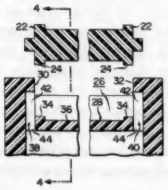
Hiroki Ichikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,182

Claims priority, application Japan, Feb. 26, 1979, 54-23832[U]

Int. Cl.³ E05D *7/10*

U.S. Cl. 16—257 **5 Claims**



1. A hinge mechanism comprising:

an eleastically deformable first member;

a pair of pins coaxially and integrally mounted on said first member and having base ends disposed on said first member and free ends extended in opposite directions relative to each other;

said first member being elastically deformable to reduce the distance between said free ends of said oppositely extending pins;

a second member made by an injection molding and having a bottom surface and a pair of side surfaces on opposite sides of said bottom surface, said bottom and side surfaces at least partially defining a recess, and a pair of grooves each having a first end portion opening only in a respective said side surface of said recess and each rotatably receiving one of said pins, each groove further having a second end portion opening in a portion of surfaces of said second member which is located in the direction of the depth of said recess, said grooves being closed on the respective sides thereof opposite said recess; and

a pair of flanges located at said base ends of said pins, each flange having a peripheral surface having a substantially circular cross section which is coaxially arranged with said pins and slidably contacting with said bottom surface of said second member;

whereby said pins are received in said first portions of said grooves by applying an external force to deform said first member to reduce the distance between the free ends of said pins so as to make the distance between said free ends of said pins less than the distance between said first portions of said grooves, aligning said free ends of said pins with said grooves and then removing said external force from said first member so that said first member is rotatably connected to said second member by said pins received in said first portions of said grooves and said bottom surface which slidably contacts with said peripheral surfaces of said flanges.

4,345,355

PROCESS AND APPARATUS FOR CUTTING A TOW AND CONTINUOUSLY OPENING THE FIBERS OBTAINED

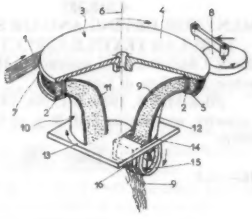
Andre Berchoux, Couzon au Mont D'Or, and Andre Coquet, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 24, 1980, Ser. No. 143,484

Claims priority, application France, Apr. 25, 1979, 79 10974

Int. Cl.³ D01G *1/04*

U.S. Cl. 19—0.6 **16 Claims**



1. A process for cutting a tow of continuous filaments and continuously opening the fibers obtained comprising, continuously winding the tow in at least one revolution over the edges of a plurality of cutting edges arranged in a ring, pressing the tow against the cutting edges to cut the filaments of the tow into ordered arrays of fibers of fixed length defined by the distance between consecutive cutting edges, collecting the ordered arrays of fibers immediately downstream of the cutting edges, and feeding the collected fibers in an orderly arrangement to an opening means whereby the fibers of the orderly arrangement are continuously opened.

4,345,356

MECHANISM FOR ELIMINATING IMPURITIES FROM FIBROUS MATERIAL, IN PARTICULAR COTTON

Karl Handschuch, Gaimersheim; Burkhard Wulfhorst, Ingolstadt, and Konrad Gilhaus, Aachen, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 193,163

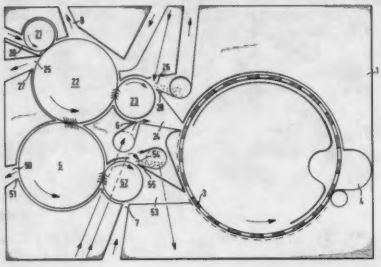
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939861

Int. Cl.³ D01G *9/12, 9/08, 9/16*

U.S. Cl. 19—200 **6 Claims**

1. A mechanism for eliminating impurities from fibrous material in particular cotton, having at least two card-clothed rolls (**22, 23**) arranged after a feed mechanism, and a screening drum to which said fibrous material is fed by means of an airstream, a housing closely enclosing said two card-clothed rolls, said housing having separating openings including separating edges provided therein, a second (**23**) of said two card-clothed rolls cooperating with a first of said two card-clothed rolls as a take-off and loosener roll for said fibrous material and the centrifugal forces at the circumference of said second

card-clothed roll being greater than at said first card-clothed roll, a third card-clothed roll closely enclosed by a housing interrupted by separating openings, said third card-clothed roll



being positioned in carding relation with said first card-clothed roll, said mechanism comprising:

a take-off and loosener roll (**52**) positioned for removing fibers from said third card-clothed roll (**5**).

4,345,357

EQUIPMENT FOR DRYING AND/OR SHRINKING OF TUBULAR TEXTILE STRUCTURES

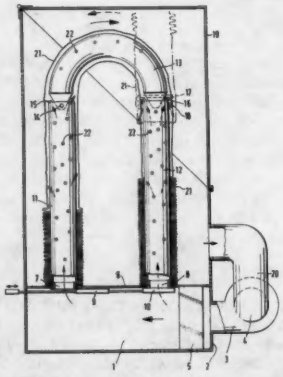
Alan Goldberg, Charlotte, N.C., assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed May 6, 1980, Ser. No. 147,155

Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2918969

Int. Cl.³ D06G *7/00*

U.S. Cl. 26—18.5 **6 Claims**



1. Equipment for the drying and shrinking of textile structures formed into a tubular conformation, comprising a pressure box, means for forcing a gaseous treatment medium into said pressure box, heating means for such gaseous medium, first and second spaced vertical perforated pipes rising from said pressure box, each of said pipes having an end in communication with said box, an arcuate pipe section connecting the ends of said vertical pipes remote from said box, means to permit movement of one end of said arcuate pipe section away from an associated vertical pipe to permit sleeving of said tubular conformation on the said associated vertical pipe, and flow control means shiftable between two alternate positions respectively connecting said first pipe to said box and blocking gaseous flow to said second pipe and connecting said second pipe to said box and blocking gaseous flow in said first pipe, whereby said gaseous medium in the pipe connected to said box is caused to react against said tubular conformation and shift the same to the pipe blocked from said gaseous flow.

4,345,358

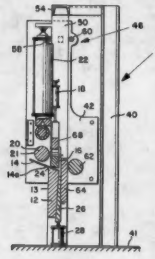
METHOD OF AND APPARATUS FOR MANUFACTURING PLOWSHARES

Dmetrios Petkidis, Protokklissi Soufli Ebrou, Greece

Filed Feb. 11, 1980, Ser. No. 120,621

Int. Cl.³ B21H *7/06*

U.S. Cl. 29—14 **2 Claims**



1. A method for forming a plowshare comprising the steps of

placing a preheated metal blank so that a first portion of its rests on the top end of a form and a second portion extends away from the top end of the form, the surface of the form having the shape of plowshare to be formed,

clamping said first portion in place so that the second portion extends at an angle which is above the horizontal,

braking the blank around an edge of the form so that said second portion of the blank forms an acute angle with said first portion by moving a roll downwardly to bend the second portion against the form, the surface of the roll also having the shape of plowshare to be formed,

moving the blank toward the roll by moving upwardly a wedge that is in contact with the form,

moving the roll upwardly to sharpen the acute angle between the first and second portions of the blank,

moving the roll downwardly to complete the making of the plowshare,

moving the wedge downwardly to allow the form to move back to its original position,

moving the roll upwardly to its original position,

and unclamping said first portion of the blank to release the plowshare from the form.

4,345,359

PROCESS FOR MANUFACTURING A PIEZOELECTRIC TRANSDUCER MADE FROM A POLYMER MATERIAL

Francois Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 18, 1980, Ser. No. 179,220

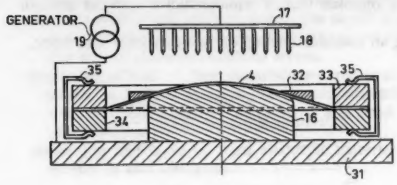
Claims priority, application France, Aug. 21, 1979, 79 21086

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **3 Claims**

1. A process for manufacturing a transducer whose active element is formed by a polymer film polarized electrically in a direction perpendicular to its faces and forming a self-supporting structure, this process consisting in stretching a flat film of polymer material in the non-polar phase over a non-developable conducting surface, in electroforming this stretched film by

means of an ionizing electric discharge produced by means of an electrode provided with points which overhang this conducting surface and in providing with electrodes the faces of the electroformed zone of this film.

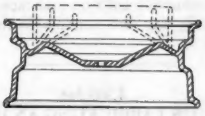


4,345,360

METHOD OF FORMING A METAL WHEEL

Robert A. Ridout, McHenry, Ill., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jul. 10, 1980, Ser. No. 168,839
Int. Cl.³ B21D *53/30*
U.S. Cl. 29—159.01 **9 Claims**



1. Method of forming a metal wheel having a rim and an integral disc from a single piece of metal, comprising:

(a) forming by extrusion a piece of metal having a first portion with a cross section substantially conforming to the cross section of the rim of the wheel to be formed, the cross section of said first portion having a width dimension and a thickness dimension, said width cross sectional dimension of the first portion being substantially greater than said thickness cross sectional dimension of the first portion, the first portion having a first surface corresponding to the outer side of the wheel to be formed and a second, opposed surface corresponding to the inner side of the wheel to be formed, and an integral second portion constituting a plane section attached to the second surface of the first portion and lying generally parallel to the width cross sectional dimension of the first portion;

(b) cutting said metal piece to a length approximately equal to the circumference of the wheel to be formed from it;

(c) bending said cut piece into a circular shape with said first surface on the outside of the circle and said second surface on the inside, whereby said attached second, planar portion is formed into a cylinder concentric with the bent, circular first portion;

(d) joining the opposite ends of said bent piece; and

(e) deforming said attached, now cylindrical, second portion to form an integrally attached disc for the wheel.

4,345,361

TOOL FOR JOINING PIPES

Gerhard Baumann, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Jul. 14, 1980, Ser. No. 168,006
Claims priority, application Switzerland, Jul. 18, 1979, 6669/79
Int. Cl.³ F16L *35/00*
U.S. Cl. 29—237 **12 Claims**

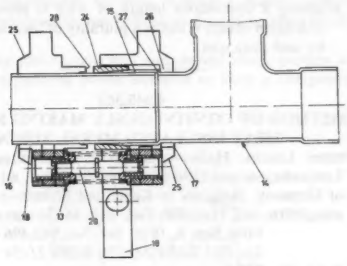
1. A system for forming a pipe joint of the type wherein end portions of pipes to be joined are telescopically assembled, one of the pipes having a radially enlarged end portion to receive the end of the other pipe, comprising

a ring having a frusto-conical interior surface;

a clamping jaw assembly including

first and second pairs of jaws with means for engaging said ring and the pipes adjacent the assembled ends, each jaw having an arcuate recess,

means for coupling the jaws of each pair together for pivotable movement about an axis parallel with the axes of the arcuate recesses, the pivot axes of said pairs being aligned,



means for biasing said first pair of jaws axially away from said second pair of jaws, and

means for urging the jaws of each pair toward each other; and

pressure clamp means for engaging said jaw assembly and for pressing said pairs of jaws toward each other for forcing said ring onto the assembled ends;

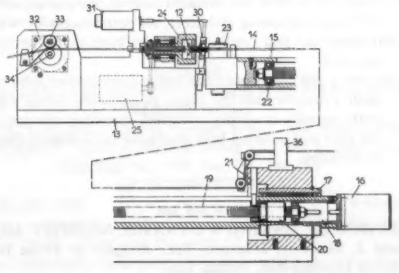
whereby said ring is forced over the outer pipe end to deform and join the assembled pipe ends by said clamping jaw assembly and said pressure clamp means.

4,345,362

PROCESS AND APPARATUS FOR STRIPPING INSULATED WIRES

Jacques de Givry, Les Loges En Josas, France, assignor to MATRA, Paris, France

Filed May 21, 1980, Ser. No. 151,760
Claims priority, application France, May 21, 1979, 79 12904
Int. Cl.³ H02G *1/12*
U.S. Cl. 29—426.5 **8 Claims**



1. A process for locally cutting the insulation sheath of an insulated wire at intervals, comprising the steps of:

(a) locating said wire along a circulation path including clamping means and cutting means in succession,

(b) moving said clamping means away from said cutting means while free from said wire and back toward said cutting means over a predetermined distance while actuated to grip said wire.

(c) closing said cutting means over said wire by an extent sufficient to cut said sheath partially and rotating said cutting means about said wire to furrow a circular groove in said sheath, while maintaining said clamping means in actuated condition,

(d) moving said clamping means away from said cutting means by an extent sufficient to break said sheath and back to its former position,

(e) opening said cutting means and de-actuating said clamping means,

(f) repeating steps (b) to (e) with optionally selected predetermined distances,

whereby a continuous length of wire is produced whose insulation sheath is cut at a plurality of locations separated by said distances.

4,345,363

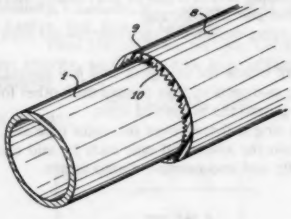
METHOD OF CONTINUOUSLY MAKING FLEXIBLE, HEAT INSULATED METAL TUBING

Ottmar Leuchs, Hannover-Bothfeld; Hans-Jürgen Klöppner, Langenhagen, and Otto Uhlmann, Burgdorf, all of Fed. Rep. of Germany, assignors to Kabel und Metallwerke Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,496

Int. Cl.[2] B22D *11/126;* **B28B** *21/54*

U.S. Cl. 29—527.4 **7 Claims**



1. Method of making a flexible, heat insulated tube for home construction purposes or the like, in a continuous process, comprising:

providing a stock of coiled, seamless drawn copper tube having a wall thickness of about 0.7 to 2 mm and an outer diameter of 8 to 35 mm;

providing a blend of 35 to 60% polyvinylchloride; 15 to 40% chalk; 15 to 30% phthalicacid ester as plasticizer; and 2 to 5% lead containing stabilizer, all percentages by weight;

soft annealing and cooling said tube both under protective gas; and

extruding the blend onto and around the cooled tube and in such a manner that the blend as extruded forms a jacket with radially inwardly directed, tapering ribs engaging the tube and defining heat insulating arch-shaped channels in between.

4,345,364

METHOD OF MAKING A DYNAMIC MEMORY ARRAY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 7, 1980, Ser. No. 137,705

Int. Cl.[3] H01L *21/22, 21/26*

U.S. Cl. 29—571 **11 Claims**

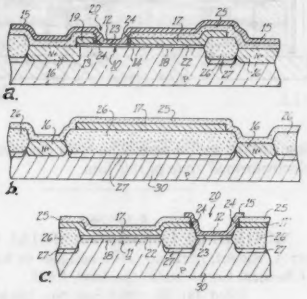
1. A method of making a dynamic semiconductor memory cell of the one-transistor type having a capacitor and a transistor comprising the steps of:

applying a layer of conductive material on a face of a body of semiconductor material overlying and separated from a first area of the face by a thin insulator,

forming a heavily doped region in said face aligned with an edge of said layer and adjacent

said first area, the heavily doped region being of conductivity-type opposite that of semiconductor material beneath it,

applying an insulator coating on said face over said layer,



opening a window in said insulator coating and in said layer over a part of said first area, and

applying a conductive strip on said face over said coating and extending into said window to form a gate of said transistor.

4,345,365

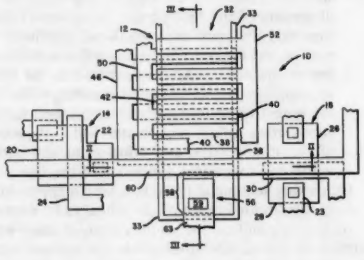
METHOD FOR FABRICATING AN INTEGRATED CIRCUIT

Donald G. Carrigan, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 6, 1980, Ser. No. 194,658

Int. Cl.[3] H01L *21/22*

U.S. Cl. 29—571 **5 Claims**



1. An improved method of fabricating charge-coupled devices of the type having a channel in a semiconductor body separated by a layer of first dielectric material from an ordered arrangement of multiple overlapping electrodes, which electrodes are formed in a sequence of depositions and patterned removals, wherein the improved process comprises the steps of:

forming said layer of first dielectric material over said channel in said substrate;

depositing a layer of first electrode material over said layer of first dielectric material;

patterning said layer of first electrode material;

removing areas of exposed first dielectric material;

forming a layer of second dielectric material over said channel;

depositing a layer of second electrode material over said layer of second dielectric material;

patterning said layer of second electrode material;

depositing a layer of third dielectric material over said substrate, said layer being significantly thicker than said layers of first or second dielectric materials;

removing material from said layer of third dielectric material in the area of said channel so that the depth of dielectric material remaining is comparable to the depth of said first and second dielectric material layers;

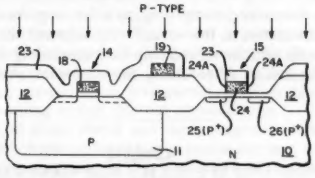
depositing a layer of third electrode material over said substrate, said third material having significantly greater electrical conductivity than said first or second electrode materials; and

patterning said layer of third electrode material over the surface of said substrate.

4,345,366
SELF-ALIGNED ALL-N+ POLYSILICON CMOS PROCESS

Ronald W. Brower, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 20, 1980, Ser. No. 198,428
Int. Cl.³ H01L *11/14*
U.S. Cl. 29—571 **6 Claims**



1. In a process for forming an integrated circuit from a structure comprising a body of semiconductor material having a first active region of a first conductivity type, a second active region of the second conductivity type, a relatively thin silicon dioxide layer formed over said active regions, the improvement comprising:

forming a first polysilicon gate over said first active region and a polysilicon layer over said second active region;

forming a mask containing impurities of the second conductivity type over the structure and laterally encompassing the first active region and defining a gate region in the second active region;

forming the polysilicon layer in the second active region to a second polysilicon gate defined by the mask;

implanting the first-conductivity-type impurities in source and drain regions defined in the second active region by the mask; and

diffusing the second-conductivity-type impurities from the mask into source and drain regions defined in the first active region by the first polysilicon gate and into both the first and second polysilicon gates;

the combination of implantation and diffusion forming a self-aligned source and drain in each of the first and second active regions, and both polysilicon gates doped with said second conductivity type impurities.

4,345,367
METHOD OF MANUFACTURING AN EXTENDED LIFE MULTICHANNEL MAGNETIC TRANSDUCER

James P. Chase, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

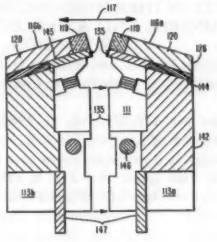
Division of Ser. No. 45,558, Jun. 4, 1979, Pat. No. 4,291,354. This application Mar. 26, 1981, Ser. No. 247,805
Int. Cl.³ G11B *5/42*
U.S. Cl. 29—603 **20 Claims**

1. A method of making a multichannel magnetic transducer assembly including the steps of forming a transducer pole tip plate of a nonmagnetic material supporting a plurality of spaced magnetic pole tips defining transducing gaps, forming a core holder of a nonmagnetic material, and said core holder having electric shielding properties, supporting a plurality of spaced magnetic core members and coil means, and mounting said transducer tip plate onto said core holder with said magnetic core members engaging associated magnetic pole tips to complete a plurality of magnetic circuits, comprising the steps of:

(a) forming a first block portion of a nonmagnetic, wear-resistant, machinable material, having two opposite planar surfaces;

(b) forming a second block portion of a nonmagnetic, conductive, machinable material, having a planar surface corresponding to one said planar surface of said first block portion;

(c) integrally joining said first and second block portion at said corresponding planar surfaces to form a composite block;



(d) machining a plurality of spaced parallel grooves in said composite block transversely to said integrally joined surfaces;

(e) integrally joining a plurality of magnetic pole tips into said grooves to obtain a half pole tip plate;

(f) assembling two corresponding half pole tip plates and integrally joining to said core holder with the first block portions of the respective half tip plates abutting at their respective planar surfaces opposite said integrally joined surfaces and with the corresponding magnetic pole tips in registration, having a nonmagnetic transducing gap material disposed therebetween and with said pole tips engaging said core members to form an integral transducer assembly; and

(g) contouring said transducer assembly at said tip plate to expose at least a portion of each pole tip defining a transducing gap to form a transducer-to-magnetic medium interface.

4,345,368
PARALLEL-TYPE HEATING CABLE AND METHOD OF MAKING SAME

David C. Goss, and Daniel R. Springs, both of San Marcos, Tex., assignors to Thermon Manufacturing Co., San Marcos, Tex.

Filed Sep. 18, 1980, Ser. No. 188,354
Int. Cl.³ H05B *3/00*
U.S. Cl. 29—611 **9 Claims**

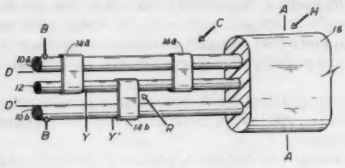
1. A continuous method of manufacturing parallel-type heating cable, comprising the steps of:

(a) continuously arranging a first and second bus wire into a spaced apart essentially parallel relationship;

(b) continuously supplying a resistive heating element between the essentially parallel to said bus wires;

(c) continuously forming a heating core from said bus wires and resistive heating element by deforming a plurality of electrically conductive splices about said first bus wire and resistive heating element and said second bus wire and resistive heating element to establish an alternating series of mechanical-electrical connections between said first

bus wire and resistive heating element and said second bus wire and resistive heating element; and



(d) continuously covering said heating element; with a protective covering.

4,345,369

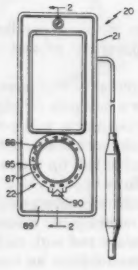
CONTROL UNIT AND ELECTRICAL SWITCH CONSTRUCTION THEREFOR—METHODS OF MAKING SUCH A CONTROL UNIT AND ELECTRICAL SWITCH CONSTRUCTION

Werner R. Bauer, Radnor, and William N. Smith, Hatboro, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 120,259, Feb. 11, 1980, Pat. No. 4,314,122, which is a division of Ser. No. 766,018, Feb. 7, 1977, Pat. No. 4,245,142, which is a continuation-in-part of Ser. No. 707,635, Jul. 22, 1976. This application Jun. 8, 1981, Ser. No. 271,527

Int. Cl.³ H01H *11/00*

U.S. Cl. 29—622 **3 Claims**



1. A method of making an electrical switch construction having a housing means carrying a pair of spaced content stops and a snap switch blade having a contact portion for being snapped between said stops when said blade is moved overcenter, and a movable actuator means carried by said housing means for moving said blade overcenter in one direction when said actuator means is moved in one direction thereof and for moving said blade overcenter in the opposite direction when said actuator means is moved in the opposite direction thereof, said method comprising the steps of forming said actuator means to be adjustable for adjusting the movement differential of said actuator means without adjusting the air gap between said contact stops, forming said actuator means to extend out of said housing means to thereby be accessible for adjustment external to said housing means, forming part of said actuator means with an actuator plunger, forming part of said actuator means with an actuator spring that is moved by movement of said actuator plunger, operatively interconnecting said actuator spring to said blade to move said blade as said actuator spring is moved, forming said actuator means with an adjustable gap defined by a pair of spaced shoulders on said actuator means that are adapted to respectively engage said actuator spring, and forming part of said actuator means from a sleeve movably carried by said housing means and being operatively associated with said plunger.

4,345,370

METHOD FOR PREPARING THE END OF A FLEXIBLE VERY HIGH FREQUENCY COAXIAL CABLE

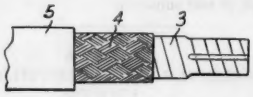
Jacques Cartier, Fontenay sous Bois, and Sebastien Givelet, Paris, both of France, assignors to Radiall, Rosny-Sous-Bois, France

Filed Jan. 30, 1980, Ser. No. 116,827

Claims priority, application France, Jan. 31, 1979, 79 02468

Int. Cl.³ H01B *13/20*

U.S. Cl. 29—828 **10 Claims**



1. In a method of preparing the end of a flexible very high frequency coaxial cable to mount a connector element thereon, the cable having a central conductor, a dielectric, a first external conductor in the form of a wound strip, second external conductor in the form of a braided conductor, and an external sheath, the method comprising, as a first step, forming at least two indentations in the wound strip adjacent the end of the cable to prevent the wound strip from unwinding during subsequent operations of mounting the connector element on the cable.

4,345,371

METHOD AND APPARATUS FOR MANUFACTURING HYBRID INTEGRATED CIRCUITS

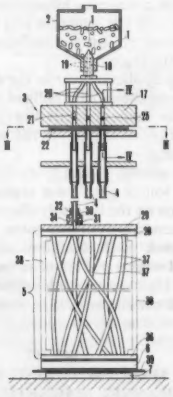
Mitsuo Ohsawa, Kanagawa; Yoshiteru Noda, Tokyo; Iwao Ichikawa, and Katsumi Yamamoto, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1980, Ser. No. 135,670

Claims priority, application Japan, Mar. 14, 1979, 54-58888; Mar. 16, 1979, 54-59914

Int. Cl.³ H05K *3/30;* **B23P** *19/00*

U.S. Cl. 29—836 **10 Claims**



1. A method of manufacturing a hybrid integrated circuit on a circuit board in which circuit elements are positioned at predetermined locations on said board and electrically connected with a conductive pattern on said board, comprising the steps of:

placing a plurality of chip-type circuit elements at respective predetermined positions on an upper side of a template;

applying adhesive material at respective locations on one

side of said board corresponding to said predetermined positions;

placing said circuit board, adhesive side down, against said template so as to bring said circuit elements into contact with said adhesive material;

inverting said circuit board with said template thereagainst so that the latter is positioned above said circuit board;

removing said template from said board;

rendering said adhesive material sufficiently set to hold said circuit elements on said board; and

soldering said circuit elements to said conductive pattern to said board.

8. Apparatus for manufacturing a hybrid integrated circuit in which chip-type circuit elements are positioned at predetermined locations on a printed circuit board, comprising

hopper means for containing a plurality of said chip-type circuit elements;

capture means for capturing said circuit elements in said hopper means;

guide means for guiding the captured circuit elements to predetermined locations;

shutter means, disposed between said capture means and said guide means, for controlling the distribution of said circuit elements from said capture means to said guide means; and

selectable template means corresponding to a selected circuit design for said hybrid integrated circuit for receiving said circuit elements from said guide means for disposition onto said printed circuit board, and having element-receiving receptacles at predetermined locations thereon corresponding to said selected circuit design;

wherein said guide means includes a magazine detachably mountable between said shutter means and said template means, the magazine having a plurality of flexible channels between said shutter means and said template means said flexible channels being pre-arrangeable, before mounting said magazine in said apparatus, to guide said elements to the particular predetermined positions of the selected template means without needing to rearrange said hopper means, in accordance with the particular circuit design for said hybrid integrated circuit.

4,345,372

METHOD OF PRODUCING A MULTICONTACT SPRING

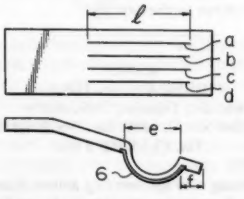
Kenji Sekigawa; Takeshi Sato, and Mikio Motizuki, all of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Oct. 26, 1979, Ser. No. 88,631

Claims priority, application Japan, Oct. 31, 1978, 53-134071

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—874 **5 Claims**



1. A method of producing a multicontact spring comprising the steps of:

blanking a metal tape to form a blank for the multicontact spring;

pressing said blank to make linear dents therein which are parallel to each other and correspond to contacting areas of said multicontact spring;

dividing said blank by repeating a press working for cutting clear through said blank a predetermined linear part which includes each one of said linear dents and does not include the end parts of said blank; and

pressing said divided parts of said blank into suitable shapes for providing contact points.

4,345,373

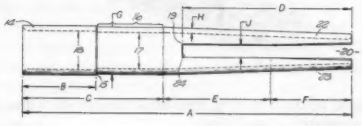
METHOD OF MANUFACTURE OF LOW-COST, HIGH QUALITY LOW INSERTION FORCE ELECTRICAL CONNECTOR SOCKET

Leonard Lacaze, Jr., San Juan Capistrano, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 951,182, Oct. 13, 1978, abandoned, which is a division of Ser. No. 850,629, Nov. 11, 1977, abandoned. This application Apr. 28, 1980, Ser. No. 144,789

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—874 **10 Claims**



1. The method of manufacture of a low insertion force electrical connector socket, comprising:

forming a length of generally tubular stock to have a generally conical inside and outside taper over a first predetermined distance (E & F) from a first end thereof;

thereafter axially slotting the side walls of said tubing from said first end to a second predetermined distance (D), said second distance not exceeding said first distance, said slotting forming a pair of tines of length equal to said second distance from said first end to a tine root region; and

partially flattening said tines while preventing plastic deformation of said tines at said root region, said partial flattening being such as to substantially modify the inside radius of said tines at least to that of said tubular stock prior to said forming operation over a third predetermined axial distance (F) from said first end, said third predetermined distance (F) being less than said second predetermined distance (D).

4,345,374

RAZOR WITH MEANS TO ADJUST BLADE GEOMETRY

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jan. 14, 1974, Ser. No. 432,842

Int. Cl.³ B26B *21/06*

U.S. Cl. 30—47 **21 Claims**

21. A razor comprising:

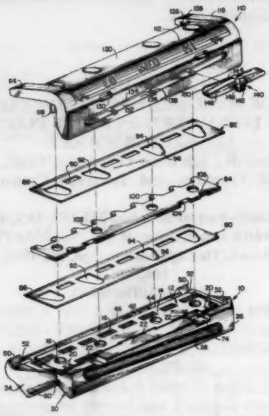
base structure having a guard surface and a blade support structure integral therewith, two blade elements permanently secured to said blade support structure with their two cutting edges being spaced apart,

the front of said blade support structure being secured to said base structure by a flexible connection and the rear of said blade support structure being spaced from and movable relative to said base structure,

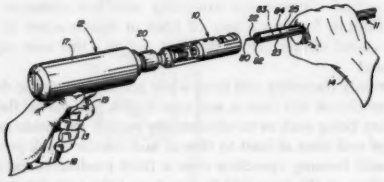
said flexible connection permitting the angular orientation of said blade support structure relative to said base structure to be changed,

and an adjusting mechanism coupled between said base structure and said blade support structure for moving said

blade support structure relative to said guard surface to change the angular orientation of said blade support structure relative to said base structure to vary the shaving geometry of said razor.



4,345,375
CABLE TOOL
Robert D. Hayward, 6142 N. 18th Ave., Phoenix, Ariz. 85015
Filed Jun. 2, 1980, Ser. No. 155,442
Int. Cl.³ H02G *1/12*
U.S. Cl. 30—90.1 **7 Claims**



1. A tool adapted to be rotatably driven for preparing a terminal portion of a coaxial cable for installation, which coaxial cable includes,

a center conductor having an end,

a coaxial tubular outer conductor,

a dielectric material for maintaining the center conductor substantially coaxially within the outer conductor, and

a jacket encasing the outer conductor,

said tool comprising:

a body having a longitudinal axis of rotation, a forward end and a rearward end;

means forming a bore in said body extending rearwardly from said forward end;

cylindrical coring means having a forward end and a rearward end, wall means forming a central passage for receiving the center conductor therewithin, the rearward end of said coring means being affixed to the rearward end of the body so that the central passage is substantially symmetric with the longitudinal axis, stop means engaging the end of the center conductor to limit the maximum length of the center conductor received within said central passage, and cutting means positioned at the forward end of the coring means for removing the dielectric material between the outer conductor and the center conductor a first distance measured from the end of the center conductor when said end engages the stop means;

tubular trimming means for removing the outer conductor,

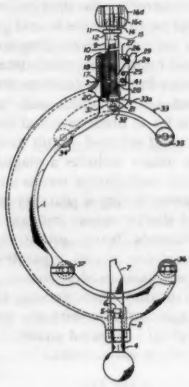
means for mounting the trimming means on said coring means to remove the outer conductor a second distance measured from the end of the center conductor when said end engages the stop means;

jacket stripping means mounted on the body for removing the jacket a third distance from the end of the center conductor when said end engages the stop means;

said first, second and third distances being different from one another; and

means for applying torque and a linear force to rotate the body about its axis of rotation and for applying a linear force to the body substantially along the axis of rotation.

4,345,376
CUTTER FOR THICK WALL PLASTIC PIPE
Albert R. Benson, and James F. Willats, both of Erie, Pa., assignors to Reed Manufacturing Company, Erie, Pa.
Filed Nov. 15, 1979, Ser. No. 94,675
Int. Cl.³ B23D *21/06*
U.S. Cl. 30—96 **10 Claims**

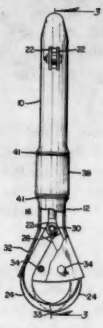


1. A pipe cutter comprising a frame rotatable relative to a pipe being cut in a plane perpendicular to the axis of the pipe, said frame having a way for a tubular carriage of circular cross section movable toward and away from the axis of the pipe, a screw in thrust relation to said tube, a slot in the frame registering with an elongated slot in said carriage, and an element received in said slots having a threaded portion engaged with said screw for keying the carriage to the frame and for establishing a screw drive to the carriage.

4,345,377
DEHORNING TOOL
Francis W. Hewes, Jr., Toponas, Colo. 80479
Filed Nov. 7, 1980, Ser. No. 204,918
Int. Cl.³ B26B *17/02*
U.S. Cl. 30—181 **14 Claims**

1. In a dehorning tool for severing animal horns including a hollow body, at least two cutting blades hingedly supported at one of their ends in said hollow body extending outside said body and having cutting edges on their outside free ends, means for moving the free ends of said cutting blades apart to permit placement of their cutting edges on the outside of an animal horn, and means for moving said free ends together for severing the horn with said cutting edges, the improvement which comprises actuating means including first immovable camming means located inside of said cutting blades for simultaneously extending and opening said cutting blades as their inner surfaces cam against said first immovable camming

means for placement of said cutting edges on the outside of said horn, and actuating means including second camming means



for simultaneously retracting and closing said cutting blades for severing said horn with said cutting edges.

4,345,378

SCISSORS WITH ADJUSTABLE PIVOT

Gunther Pracht, Solingen, Fed. Rep. of Germany, assignor to "Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft, Solingen, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,477

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023057

Int. Cl.³ B26B *13/04*

U.S. Cl. 30—266 **2 Claims**

1. Scissors useful particularly by hairdressers, comprising

(a) a movable scissors blade and a stationary scissors blade;

(b) a pivotal connection connecting said movable scissors blade and said stationary scissors blade and consisting of a threaded pin having a shank, a head and a threaded steel nut provided with a projection formed with an annular groove extending over the periphery of the said projection, the threaded pin passing with its shank through a hole of the movable scissors blade and a hole of the stationary scissors blade and being non-rotatably held by one of the scissors blades;

(c) a circular recess provided in the stationary scissors blade and defining a circular wall, said circular wall being arranged to guide the threaded steel nut via the projection thereof, and

(d) an annular body consisting of resilient material which is arranged in said annular groove and engages the projection and the circular wall of the circular recess with contact pressure.

4,345,379

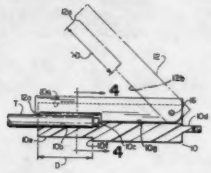
TUBE MARKING DEVICE AND GAGE

Lucius A. Pettingill, Jr., 1855 Main St., Glastonbury, Conn. 06033

Continuation-in-part of Ser. No. 171,812, Jul. 24, 1980, abandoned. This application Nov. 10, 1981, Ser. No. 320,052

Int. Cl.³ B43L *9/00*

U.S. Cl. 33—21 R **5 Claims**



1. A device for marking a tube at a predetermined distance from the tube end such that assembly of the tube with a fitting will not obscure the marking, said device comprising:

(a) a generally cylindrical elongated housing having an elongated slot open along one side of the housing, said housing defining a central bore defined axially therein and open to one end of said housing to receive the tube to be marked,

(b) said bore having an inner end intermediate the ends of said housing and said slot having a portion communicating with said bore, and another portion of said slot defined by said housing and having an inner wall which is parallel and closely spaced to th axis of said housing,

(c) a tube marking tool of approximately the same length as said elongated housing and located at least partially in said slot, said tool having marking means at one end and having its other end pivotally mounted in said housing slot adjacent the other end of said housing,

(d) said tool having a stop surface spaced from said pivotally mounted other end which stop surface abuts said inner wall of said housing slot when said tool is in its active position for marking a tube, whereby said marking means at said one end of said tool cannot penetrate the surface of the tube being marked and can only burnish the tube in the marking made thereon.

4,345,380

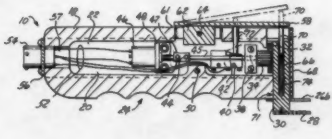
GAP GAUGE

Arthur D. Vis, Warren, Mich., assignor to Candid Logic, Inc., Hazel Park, Mich.

Filed Mar. 6, 1981, Ser. No. 241,196

Int. Cl.³ G01B *7/02*

U.S. Cl. 33—147 N **16 Claims**



1. Apparatus for measuring the gap between opposed surfaces of a pair of spaced apart parts, comprising:

first and second means insertable into said gap for respectively contacting said opposed surfaces;

means for mounting said first and second contacting means for reciprocable movement toward and away from each other;

means coupled with said mounting means for displacing said first and second contacting means in a direction away

from each other and respectively into engagement with said opposed surfaces; and,

means for sensing the relative displacement between said first and second contacting means, including means for producing an electrical signal corresponding to the magnitude of said gap, said first contacting means including a pair of finger members, and said second contacting means including one finger member, said pair of finger members being spaced apart and defining a space therebetween within which said one finger member may be received.

4,345,381

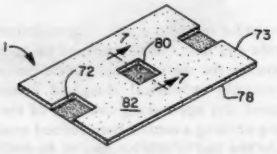
UNIVERSAL MEASURING TEMPLATE

Patricia C. Brislin, 1770 Hidden La., Lancaster, Pa. 17603

Filed Feb. 8, 1980, Ser. No. 119,722

Int. Cl.³ G01B *3/14*

U.S. Cl. 33—174 G **10 Claims**



1. A transferable universal template for marking and locating utility outlet, window and door openings in construction panels comprising:

a carrier of flexible material having front and rear sides;

a plurality of perforations in said carrier; and

a film of adhesive covering the rear side of said carrier and spanning said perforations, said film of adhesive having adhesive properties on both sides thereof whereby the adhesive portions exposed through said perforations on the front side being less than the adhesive on the rear side whereby said template is transferable from one surface to another.

4,345,382

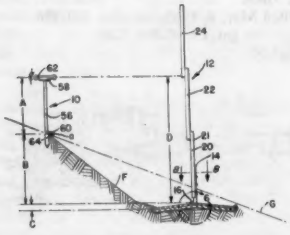
CONTRACTOR'S GRADE ROD APPARATUS AND PROCEDURE FOR SETTING AND CHECKING GRADES

Dwight D. Warren, Rte. 2, Box 155A, Scott Loop Rd., Mobile, Ala. 36609

Filed Feb. 13, 1980, Ser. No. 121,064

Int. Cl.³ G01C *15/02, 15/06*

U.S. Cl. 33—294 **5 Claims**



1. Apparatus for use in setting and checking grades in construction of roads, parking lots, buildings, or the like comprising a level support in combination with a level rod wherein said level support has a nominal length of X plus Y, for example, said level rod includes a zero mark above which are plus (+) graduations in terms of a principal dimension and a subordinate dimension and below which are minus (−) graduations in terms of said principal and subordinate dimensions down to a length of X and a leg member adjustably secured to said rod, said leg member having a foot portion extending below the lower end of said rod, said leg member being adjustable so that said foot portion may be selectively set to extend below the lower end of said rod for a minimum distance of Y or more as desired, whereby said zero mark may be selectively set at a distance equal to the nominal length of X plus Y above the lower end of said foot portion so that in use of said apparatus the zero mark of said level rod corresponds to the height of said level support;

said level rod also includes a plurality of selectively adjustable sections and means for releasably securing each of said sections to another of said sections adjacent thereto and means for releasably securing said leg member to the lowest one of said sections when said level rod is held in generally vertical position for use;

said lowest one of said sections having said graduations on a front surface with a back surface behind said front surface wherein said means for releasably securing said leg member comprise a plurality of fixed threaded studs extending from said back surface and nuts threaded on said studs, and said leg member is provided with an elongate slot through which said studs extend to facilitate sliding adjustment between said leg member and said lowest one of said sections when said nuts are loosened on said threaded studs;

said leg member comprises a relatively narrow elongate segment in contact with said back surface of said lowest one of said sections, and a relatively wide short segment at the longer end thereof extending down to said foot portion, said relatively wide short segment having a generally horizontal abutment to limit upward adjustment of said leg member with respect to said lowest one of said sections whereby said foot portion will be below the lower end of said lowest one of said section by a distance Y;

said back surface is provided with vertical graduations in inches of downwardly increasing magnitude and said leg member includes indicia means to show the amount by which said leg member and said lowest one of said sections are extended with respect to each other, and said principal and subordinate dimensions are in terms of feet and inches, respectively; and

said lowest one of said sections comprises a pair of parallel grooves on said back surface, each of said grooves extending upwardly from the lower end of said lowest one of said sections to terminate at a blind end adjacent the upper end of said lowest one of said sections.

4,345,383

DESIGNER'S TRIANGLE

Douglas F. Corsette, 6559 Firebrand, Los Angeles, Calif. 90045

Filed May 28, 1980, Ser. No. 153,858

Int. Cl.³ B43L *13/00*

U.S. Cl. 33—474 **8 Claims**

1. A designer's triangle comprising:

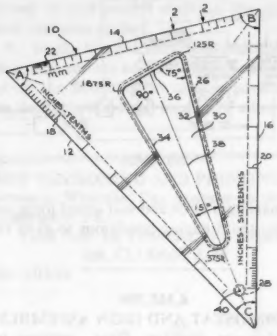
a planar sheet of clear plastic material having three external edges forming a triangle with angles of 45°, 60°, and 75°, respectively;

said planar sheet defining a triangular cutout opening with three internal edges forming a right triangle having angles of 15°, 75° and 90°, respectively;

each of said internal edges being offset by 15° from its corresponding adjacent external edge;

said triangular cutout opening being oriented relative to the external edges such that the hypotenuse of the right triangle is perpendicular to the external edge which is opposite the 45° angle and the bisector of the 15° angle of the interior triangle coincides with the bisector of the 45°

angle, said plastic sheet also defining a referencing hole at the intersection of said common bisector and the extensions of the two interior edges defining the 15° angle of the internal triangle.

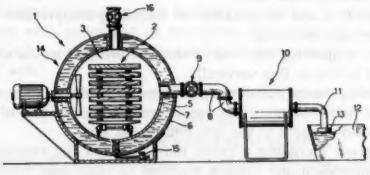


4,345,384

PROCESS FOR DRYING WOOD

Vincenzo Pagnozzi, Rocchetta di Cairo Montenotte (Savona), and Ernesto G. Pagnozzi, Via Camponuovo, Cairo Montenotte (Savona), both of Italy

Filed Feb. 19, 1981, Ser. No. 235,791
Claims priority, application Italy, Mar. 12, 1980, 67381 A/80
Int. Cl.³ F26B 5/04
U.S. Cl. 34—16.5 5 Claims



1. A high temperature process for drying wood in a room adapted to be hermetically sealed and having heated pressure resistant walls with suitable valve means extending therethrough comprising;

preheating said room in sealed condition to provide steam at a first pressure in said room above atmospheric pressure and heating the wood to a first predetermined temperature greater than 100° C. thereby preventing the evaporation of water from the wood and preventing condensation of water vapor on the walls of the room, and

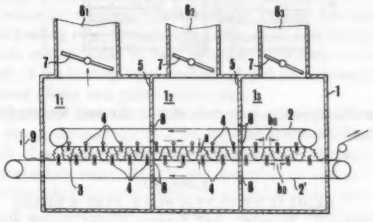
subsequently discharging a metered quantity of steam from said room through said valve means while simultaneously supplying sufficient heat to said room to maintain said first pressure and said first temperature substantially unaltered to remove water from said wood.

4,345,385

METHOD FOR CONTINUOUS DRYING OF A CLOTH AND AN APPARATUS THEREFOR

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works, Wakayama, Japan

Filed Jun. 3, 1980, Ser. No. 156,182
Claims priority, application Japan, Jun. 14, 1979, 54-74968; Sep. 26, 1979, 54-123473; Oct. 20, 1979, 54-135423
Int. Cl.³ F26B 3/04, 13/06
U.S. Cl. 34—23 6 Claims



1. A method of continuously drying a cloth comprising transporting the cloth through a cloth passage defined by a pair of endless net conveyers arranged one above the other in parallel, drying the cloth using high pressure dry hot air and jetting the dry hot air from nozzles against the cloth, arranging the nozzles extending transversely of the direction of movement of the cloth through the cloth passage on opposite sides of the cloth and offset relative to one another so that the nozzles are disposed above and below the cloth passage in a zigzag manner, and driving the two conveyers so that the combination of the movement of the cloth and the jetting action of the dry hot air effects beating and vibrating of the cloth as the cloth passes through the cloth passage in a snaky state under no tension for drying of the cloth, dividing the cloth passage into at least three separate chambers arranged one after the other in the direction of movement of the cloth and drying the cloth in the first chamber at about 150° C., drying the cloth in the second chamber at about 100° C., and drying the cloth in the third chamber at about 70° C., prior to said drying process, with the cloth in a ropy state, moving the cloth generally horizontally and untwisting the cloth in the ropy state by jetting high pressure air against the cloth from below, and then expanding the cloth by jetting high pressure air against the cloth zigzag from above and below from nozzles extending transversely of the direction of movement of the cloth.

4,345,386

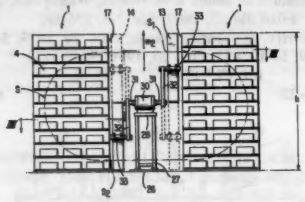
AIR AGITATION DEVICE

Carra Gianni, Suzzara, Italy, assignor to Carra Officine Meccaniche S.p.A., Codissoto de Luzzara, Italy

Filed Dec. 29, 1980, Ser. No. 220,919
Claims priority, application Italy, Dec. 31, 1979, 3582 A/79
Int. Cl.³ F26B 9/06
U.S. Cl. 34—218 2 Claims

1. An air agitation device placed in a multiple section drying chamber having a central passageway between shelf sections, the device positioned in the passageway existing between two opposite sets of shelves on which articles to be dried are placed, the air agitation device comprising: at least two crankshafts, each having a crankpin, said crankshafts being identical, oriented in the same direction and rotating with respect to axes perpendicular to the longitudinal surfaces of said sets of shelves that face the passageway, and situated in proximity of the extremities of the said passageway; motor means for driving at least one of said crankshafts; journal means allowing the rotation of said crankshafts about said perpendicular axes; at least two frames articulated to corresponding crankpins of the said crankshafts, and placed on two parallel planes positioned one on each side of said journal means of the said crankshafts

and perpendicular to the said journal means; and means of ventilation, carried by the same frames, for producing a flow of air in the direction perpendicular to the said longitudinal surfaces of the sets of shelves.

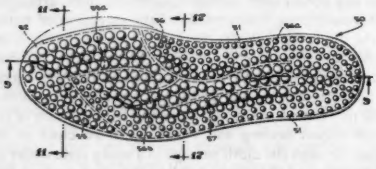


4,345,387

RESILIENT INNER SOLE FOR A SHOE

Alexander C. Daswick, 647 Orange Grove, South Pasadena, Calif. 91030

Filed Mar. 31, 1980, Ser. No. 135,333
Int. Cl.³ A43B *13/38, 7/06, 13/20*
U.S. Cl. 36—43 **7 Claims**



1. An inner sole for a shoe, comprising:

a generally flat sheet member made of resilient material;

said sheet member having a flat under surface with a plurality of openings therein which are upwardly enlarged to form air pockets, the material of said member extending across and thereby enclosing the upper sides of said air pockets;

whereby air flows through said openings out of or into the associated air pockets in response to impacts upon the upper surface of said member;

said sheet member also having a peripheral flange depending downwardly from the outer portion of the under surface thereof, said flange extending around most of the perimeter of said member; and

a gap in said flange so that air may flow into or out of the space between the under surface of said member and the supporting surface of a shoe within which said inner sole is placed.

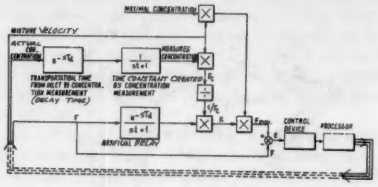
4,345,388

METHOD FOR CONTROLLING THE PRODUCTION OF A DREDGING APPARATUS

Cornelis de Keizer, Dordrecht, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Mar. 27, 1980, Ser. No. 134,477
Claims priority, application Netherlands, Mar. 27, 1979, 7902381
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—195 **2 Claims**

1. A method of dredging, comprising moving a dredging instrument in contact with submarine soil with sufficient force to loosen said soil, removing said loosened soil in admixture with water from the dredging face, determining the maximum possible concentration of said mixture, determining the maximum force with which said soil resists the dredging operation corresponding to said maximum concentration, continuously determining the actual force with which said soil resists the dredging operation, continuously determining the difference between said maximum force and said actual force, and continuously changing the dredging conditions so as to reduce said difference.

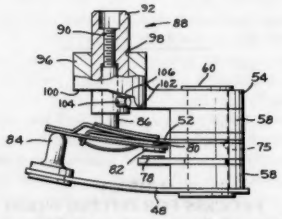


4,345,389

THERMOSTAT AND IRON ASSEMBLY

Charles A. Balchunas, Bethany, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,533
Int. Cl.³ D06F *75/06*; H01H *37/26*
U.S. Cl. 38—77.7 **8 Claims**



1. A stacked snap-acting thermostat assembly of a lower heat deformable blade, a conductive intermediate stiff blade, a conductive upper less stiff spring blade with all blades supported, secured together and spaced apart at one end by interposed insulators, said upper blade comprising;

first and second strip type elongated elements substantially parallel to each other,

each first and second element including compression and tension portions,

means supporting one end of the first element so the other end is free to flex vertically,

insulating means transferring deformable blade movement to said first element, pivot means connecting one end of the second element to the free end of the first,

said pivot including a pivot joint between the respective compression and tension portions to place said portions under compression and tension respectively,

stops on opposite sides of the non-pivot free end of the second element and related to said pivot means so the second element free end reciprocates between said stops with a snap-action on reciprocal movement of the pivot joint between said elements,

one of said stops being a fixed contact on the stiff intermediate blade and the other a movable stop on the free end of said first element to make and break an electric circuit to control heat to a medium sensed by said thermostat,

a single structural bracket extending over all said blades and mounted on and above said supported end with an enlarged integral portion on the free end,

said portion having a bore therethrough forming an elongated bearing guide between the ends of and over said blades,

a control shaft rotatably supported in said bore and extending into contact with the tension portion of said first element to

position said upper spring blade, an arcuate cam surface with end stops formed on said integral portion and facing said upper blade,

a cam follower on said control shaft and biased by said upper blade against said cam surface,

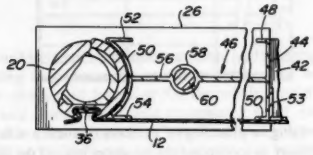
whereby the single bracket performs multiple functions of shaft bearing, cam surface and end stops, and with its shaft, an adjustment on the first element tension portion to vary the snap-action, and acts as a fixed locator of all structural parts.

4,345,390

SCREEN TENSIONING AND PRINTING FRAME

Don E. Newman, Wyncote, Pa., assignor to Stretch Devices, Inc., Philadelphia, Pa.

Filed Nov. 13, 1980, Ser. No. 206,213
Int. Cl.³ D06C *3/08*
U.S. Cl. 38—102.91 **16 Claims**



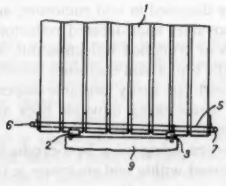
1. Apparatus comprising a screen tensioning and printing frame, said frame having a plurality of rollers coupled together by corner members which support the rollers for rotation about their longitudinal axes, each roller having a longitudinally extending channel on its periphery, a retainer means for each channel to retain an edge portion of a screen fabric in each channel, means associated with each corner member for locking each roller in a predetermined rotative position so that a desired tension may be applied to a screen fabric, a dam member associated with each roller, each dam member being inwardly of its associated roller and extending between adjacent corner members so that the dam members may form a dam for a printing medium to be applied through a screen fabric, the improvement comprising a discrete means connected to each dam member and cooperating therewith for at least partially opposing undesired inward bowing of the associated roller, said last-mentioned means including a discrete limit stop between each roller and its associated dam member, each limit stop being connected to its associated dam member by at least one web.

4,345,391

LAUNDRY FEEDING MACHINE

Henry J. Weir, "Alta Vista" Knapton Rd., Dublin, Ireland

Filed Jul. 9, 1980, Ser. No. 167,213
Claims priority, application Ireland, Jul. 9, 1979, 486/79
Int. Cl.³ D06F *67/04*
U.S. Cl. 38—143 **15 Claims**



1. An apparatus for finding and clamping the corners of the leading edge of a rectangular laundry flatwork piece so as to be able to fully extend said leading edge, said apparatus comprising:

a pair of clamp and guide means selectively operable to a clamping or to an unlocked condition, each of said clamp and guide means having a leading edge accepting configuration for accepting arbitrary portions of said leading edge with said pair of clamp and guide means disposed closer together than the length of said leading edge, said clamp and guide means captively guiding said leading edge for passage throught said guide means;

first means for effecting relative motion between portions of said leading edge of said piece and each of said clamp and guide means while in said unlocked condition to bring each of the leading edge corners of said piece toward the closest clamp and guide means; and,

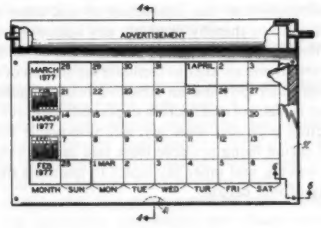
sensing means associated with each clamp and guide means to detect the passage of a leading edge corner closed to each of said clamp and guide means, said pair of clamp and guide means responding to the detection of passage of a leading edge corner past the associated sensing means by being actuated to said clamping condition to clamp against the associated corner portion of said leading edge.

4,345,392

CALENDAR

Robert W. Cornell, 40 Belknap Rd., West Hartford, Conn. 06117

Continuation of Ser. No. 951,745, Oct. 16, 1978, abandoned.
This application Sep. 8, 1980, Ser. No. 184,749
Int. Cl.³ G09D *3/10, 3/04*; G09F *11/18*
U.S. Cl. 40—116 **3 Claims**



1. A flat, continuous, appointment calendar essentially consisting of a one-piece support holder having a flat bottom with a finger recess, a flat frame-like top having a top edge, bottom edge, and two side edges and overlying said flat bottom and spaced to accommodate sliding of a flexible continuous calendar sheet having calendar indicia thereon, and one-piece support also having a curved enclosure defined section connecting the top and bottom to form a chamber to hold the rolled up portion of the continuous calendar sheet, a unitary attachment means holding the top and bottom together along the side edges, an aperture defined by said frame-like top flat member to gain access to the calendar sheet so as to permit writing thereon, and the names of the days of the week and the word "month" printed or embossed on the holder along the top or bottom edge of the aperture, and a flexible, continuous calendar sheet having calendar indicia printed thereon, said indicia being divided in rows indicating the month or giving other month information and the days of the month, and in columns indicating month information and the days of the week, the columns arranged so that each day will be separately defined in each row even when the months change so that pulling the row out of view of the aperture will expose at least more than one future week, and weekly rows being detachable from the calendary sheet without affecting the succeeding weekly rows.

4,345,393

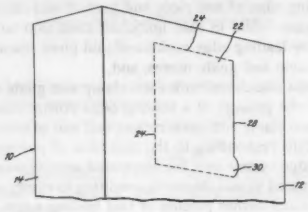
PEELABLE ON-PACKAGE COUPON AND METHOD FOR MAKING SAME

Charles E. Price, Delton; George C. Ray, III, Battle Creek; Harold R. Grieve, Battle Creek, and Robert G. Tomich, Battle Creek, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 836,873, Sep. 26, 1977, abandoned. This application Mar. 28, 1980, Ser. No. 134,736

Int. Cl.³ G09F *3/00*

U.S. Cl. 40—312 **6 Claims**



1. A carton constituting an erected carton blank formed from laminated packaging material and comprised of an inner relatively rigid ply, an outer relatively pliant ply adapted to have indicia imprinted on at least the outer surface thereof, and adhesive disposed intermediate said plies for laminating same to each other, the outer ply of said blank having a manually removable section at a predetermined interior surface area thereof enclosed by a tear outline comprised of a series of slits penetrating through said outer ply to a depth less than the thickness of said blank said slits being formed in said carton blank subsequent to the lamination of said outer ply to said inner ply and to thereby preclude any adhesive between said plies entering said slits, the opposed edges of said slits being unadhered to one another to facilitate separation of said section from said outer ply, and an adhesive release agent coated on the inner surface of said section to prevent adhesive bonding of said section with said inner ply, said removable section in the erected carton being peelable from said carton along said tear outline leaving said inner ply intact to maintain the structural integrity of said carton.

4,345,394

POCKET SHEET INSERT SHEET ASSEMBLAGE AND METHOD OF USING THE ASSEMBLAGE

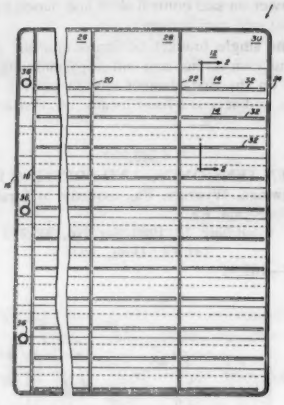
David T. Sullivan, 2 Westbrook Dr., Nashua, N.H. 03060

Filed Jun. 19, 1981, Ser. No. 275,353

Int. Cl.³ B42F *19/00*

U.S. Cl. 40—405 **10 Claims**

1. An assemblage comprising: at least one pocket sheet and at least one insert sheet, the pocket sheet and the insert sheet having substantially equal lengths and widths; each insert sheet comprising: a plurality of inserts on which information may be placed that are separable from each other; and each pocket



sheet comprising: a plurality of pockets of such a size as to so receive an insert as to expose information placed on the insert.

4,345,395

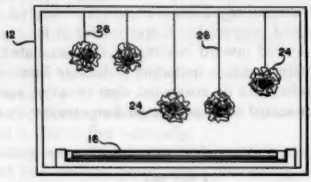
METHOD AND APPARATUS FOR PRODUCING DAY-NIGHT PICTURES

Gloria Grassi, 1511 E. Highland Ct., Ontario, Calif. 91764

Filed Dec. 1, 1980, Ser. No. 211,737

Int. Cl.³ G09F *19/00, 13/06;* **A63J** *3/00*

U.S. Cl. 40—441 **7 Claims**



1. A day-night picture assembly comprising:

(a) a generally opaque picture having a large number of small translucent apertures therein;

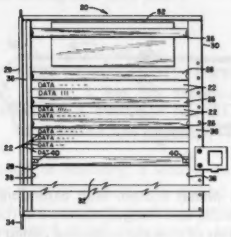
(b) a generally opaque frame forming an enclosure behind said picture;

(c) a light source disposed in said enclosure; and

(d) randomly movable, multi-faceted reflector means consisting of balls of crumpled reflective foil, each ball suspended from the top of said enclosure behind said picture by a single thread-like, easily twistable suspensions means, said reflector means being movable back and forth and capable of turning and twisting;

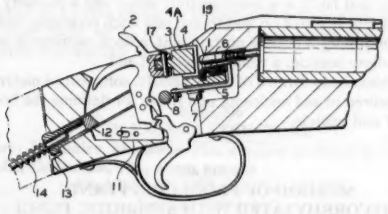
(e) said light source being of a heat-producing type and being so positioned within said enclosure as to expose said reflector means to convection air currents generated by the heat produced by said light source, said convection air current causing said back and forth and turning and twisting movement of said reflector means.

4,345,396
VISIBLE INDEXES
Alexander P. Janssen, c/o Datastrip Corporation, 1575 Avon St. Extended, Charlottesville, Va. 22901
Filed Dec. 3, 1980, Ser. No. 212,625
Int. Cl.[3] G09F *3/04*
U.S. Cl. 40—490 5 Claims



1. A visible index comprising a frame and a spring spacer for positioning an index strip or other component in a selected location along said frame or for detachably holding an item against said frame, said frame comprising a flat, sheetlike support and means at opposite edges of said support forming channels into which ends of said spacer can be fitted and said spacer comprising an elongated integral strip of elastically deformable material having integral means at the opposite ends of said strip for retaining those ends in said channels, said retaining means being resiliently biasable tab-like portions struck out of said strip, those ends of the struck out portions nearest the ends of said strip being spaced inwardly from the outer ends of said strip and being integral with said strip, and said struck out portions having segments thereof engageable with the means defining said channels, each segment being shaped at its periphery so as to avoid marring of or damage to said frame during insertion therewithin or withdrawal therefrom.

4,345,397
ALTERNATE FIRING METHOD
Mondo L. Hartman, R.R. 2 Box 281, Kalkaska, Mich. 49646
Filed Apr. 2, 1980, Ser. No. 136,684
Int. Cl.[3] F41C *19/00*
U.S. Cl. 42—42 B 5 Claims

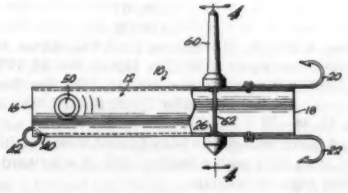


1. A double barrel firearm having a frame, a stock, and a firing mechanism; said firing mechanism comprising a hammer having a pivoted front face, a release catch, a single trigger, and selector means for selecting the firing sequence of the barrels; said selector means comprising a selector cam pivotably mounted in said frame by a pivot pin for deflecting said hammer front face to a selected barrel, and means locating said cam selectively in first, second, and third positions; said locating means comprising a positioning lever, a compression spring with one end attached to said lever and the other end attached to said cam, and a control pin for moving said lever; said control pin being positionable in first, second, and third positions to move said cam to its first, second, and third positions; said first and third positions allowing continuous firing of either of the barrels, and the second position allowing automatic sequential firing of the barrels; and a locking means for holding said control pin in each of its positions.

4,345,398
GUN REST
Fred E. Pickett, 508 Sophia La., Shreveport, La. 71115
Filed Jun. 9, 1980, Ser. No. 158,060
Int. Cl.[3] F41C *29/00*
U.S. Cl. 42—94 8 Claims

1. A gun rest for supporting a firearm comprising:
(a) a monopod characterized by a tapered base member and a plurality of tapered interior members carried by said base member in telescoping and locking relationship when said interior members are extended;
(b) pivot clamp means carried by one end of said monopod in pivotal relationship;
(c) a clamp mount plate supporting said pivot clamp means and disposed above said monopod;
(d) a monopod clamp means carried by said clamp mount plate and removably engaging said monopod when said interior members are in retracted, telescoped configuration inside said tapered base member; and
(e) a pair of barrel clamps mounted on said clamp mount plate for removably positioning said clamp mount plate and said monopod on the barrel of said firearm.

4,345,399
VIBRASONIC FISHING LURE
Chet Guzik, 8520 SW. 122nd St., Miami, Fla. 33156
Continuation-in-part of Ser. No. 91,370, Jan. 2, 1980, abandoned. This application Jul. 7, 1980, Ser. No. 166,354
Int. Cl.[3] A01K *85/01*
U.S. Cl. 43—42.06 18 Claims



1. A fishing lure comprising:
a tubular body defining an axial interior chamber;
means to create sonic effects including a strip of resilient

material secured within, and spanning under the tension, the interior chamber in a position to react vibrasonically to the movement of water axially through said interior chamber; and

hook means connected to the tubular body.

4,345,400

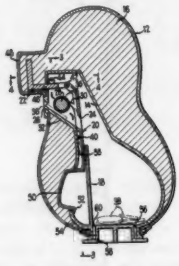
PLUSH BANK

Allison W. Katzman; Edward T. Holahan; John V. Zaruba, all of Chicago, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 3, 1980, Ser. No. 212,348

Int. Cl.³ A63H *33/00*

U.S. Cl. 46—4 **17 Claims**



1. A toy bank comprising:

an outer, inwardly displaceable housing in the form of a plush animate figure including means for receiving tokens, such as money or the like;

a tokens receptacle disposed within said bank for storing a quantity of tokens;

passage means to direct said tokens from said outer housing to said tokens receptacle;

means, disposed within said outer housing along said passage means, for engaging said tokens temporarily to prevent said tokens from being received within said tokens receptacle;

means for moving said tokens past said engaging means to permit said tokens to be received by said tokens receptacle and an inner housing including a flexible upstanding wall defining a portion of said coin receptacle, said means for engaging said tokens comprises a pawl and ratchet mechanism comprising a pawl extending from an interior frame member, said pawl adapted to engage a ratchet mechanism on said token engaging means so that actuation of said pawl against said ratchet mechanism causes rotation of said token engaging means, said frame member includes token receiving means defining a portion of said passage means, said token receiving means on said frame member adapted to remain in alignment along said passage means during actuation of said pawl and ratchet mechanism.

4,345,401

GLIDER

Jeffrey A. Brzack, 140 Maumee Trail, Lake Orion, Mich. 48035

Continuation-in-part of Ser. No. 48,610, Jun. 13, 1979, Pat. No. 4,280,673. This application Jun. 13, 1980, Ser. No. 159,102

Int. Cl.³ A63H *27/00;* **B64C** *1/00*

U.S. Cl. 46—79 **5 Claims**

1. A glider including a body formed from a multi-sided tube open at its ends with a leading edge at a forward end and a trailing edge comprising:

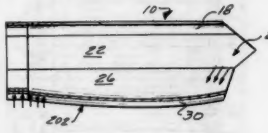
the tube comprising a plurality of walls of uniform thickness joined together to define an integral member, including;

a top wall of planar configuration;

a pair of opposed upper side walls of planar configuration integral with the top wall extending downward and outward a distance;

a pair of opposed vertical side walls of planar configuration integral with the upper side walls;

a pair of opposed lower side walls of substantially planar configuration integral with the vertical side walls extending downward and inward to a point inward of a vertical extension of the top wall and upper side wall intersection;



a substantially planar bottom wall extending between the lower side walls and integral therewith, the bottom wall including a pair of upward extending planar sections meeting at a center thereof forming a ridge; and

the opposed lower side walls and the planar sections of the bottom wall cambered with a convex side downward.

4,345,402

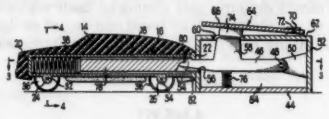
TOY VEHICLE AND LAUNCHER

Steven P. Hanson, Rancho Palos Verdes; Robert E. Smathers, Los Angeles, both of Calif., and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 4, 1980, Ser. No. 213,035

Int. Cl.³ A63H *17/00*

U.S. Cl. 46—206 **7 Claims**



1. A toy vehicle and launcher, in combination, comprising

means for launching said vehicle, said launching means including a latch and a member for actuating said latch;

a biasing means for propelling said vehicle;

a relatively rigid vehicle frame including means for receiving said latch in a pre-launching mode and a plurality of wheels mounted on said frame, said latch receiving means comprising a hollow portion with a hook member in said hollow portion, a resilient member; and

a vehicle body formed of a low density, soft, porous material secured to and enclosing said frame for defining the body of said vehicle.

4,345,403

METHOD OF PRODUCING PLANTS MYCORRHYZATED WITH SYMBIOTIC FUNGI

Giusto Giovannetti, Turin, Italy, assignor to Pegasus Pension Fund S.A., Panama City, Panama

Filed Feb. 9, 1981, Ser. No. 232,876

Claims priority, application Italy, Feb. 18, 1980, 67244 A/80

Int. Cl.³ A01G *1/04*

U.S. Cl. 47—1.1 **9 Claims**

1. A method for producing plants mycorrhyzated (i.e. having their roots associated) with symbiotic fungi, which comprises the following steps:

(a) Cultivating a set of young plants in sterile soil;

(b) Mycorrhyzating said young plants grown under sterile conditions, by placing the roots of said plants in contact with roots previously mycorrhyzated with the desired

fungus and taken under natural conditions from other plants;

(c) Planting the resulting pilot young plants in sterile soil;

(d) Cutting secondary roots mycorrhyzated witth fungi different from the desired fungus from already adult plants to be mycorrhyzated, and sterilizing remaining roots, and

(e) Mycorrhyzating said adult plants by planting them in sterile soil among said pilot plants.

4,345,404

TREE SURGERY METHODS

Neil A. Benfer, Jr., Rte. 3, Box 313, Tappahannock, Va. 22560

Filed Sep. 3, 1980, Ser. No. 181,248

Int. Cl.³ A01N *3/04*

U.S. Cl. 47—8 **6 Claims**

1. The method of repairing a wound on a tree or shrub comprising the steps of cleaning the wound site by removing sufficient wood to provide an elliptical or oval site wherein all damaged or diseased wood is removed, applying a coating mixture of fiberglass resin and hardener to said site, whereby air and moisture are excluded from said wound site by the resultant coating.

4,345,405

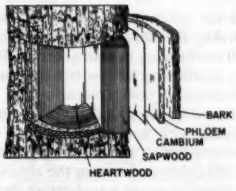
METHOD OF INDUCING LIGHTWOOD FORMATION IN LIVING CONIFERS

James W. Davis, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 27, 1981, Ser. No. 248,633

Int. Cl.³ A01M *21/00*

U.S. Cl. 47—10 **18 Claims**



1. In the method of inducing lightwood formation in a living conifer, the improvement wherein the sapwood of a selected section of a living conifer is heated internally to a temperature of from about 40° C. to about 100° C. by means of an energy source that will not kill the tree.

4,345,406

BLEACHER STRUCTURE

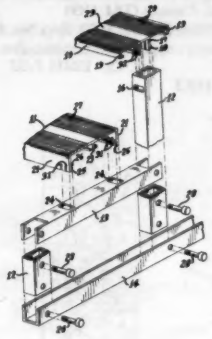
Larry L. Motley, Marianna, Fla., assignor to Jewell C. Griffin, Jr., Cottondale, Fla., a part interest

Filed Dec. 13, 1979, Ser. No. 103,392

Int. Cl.³ E04H *3/12*

U.S. Cl. 52—8 **10 Claims**

2. A bleacher structure having channel beam seat members and channel beam footrest members supported by an interconnected system of upright posts being rectangular in cross-section, cross beams, and diagonal stiffening members, said seat members having flat legs with hook projections to be inserted inside the upper open end of said posts to lie adjacent flat inner and opposed surfaces of said rectangular posts, and by spring action to lock said projections into slots in said posts so as to connect said seat members securely to said posts, the top edge of each of said posts being contacted by the lower surface of respective said seat members to support said members, and said footrest members adjacent the outside edges thereof having legs extending downwardly with hook projections to be inserted into slots in said cross beams and by spring action to lock



into said slots so as to connect said footrest members securely to said cross beams.

4,345,407

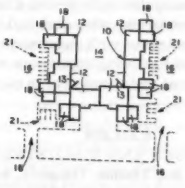
MULTI-UNIT DWELLINGS

Maurice J. Fishman, 2751 S. Ocean Dr., Apt. #PH8 S. Tower, Hollywood, Fla. 33019

Filed Jun. 2, 1980, Ser. No. 155,503

Int. Cl.³ E04H *1/04*

U.S. Cl. 52—169.3 **11 Claims**

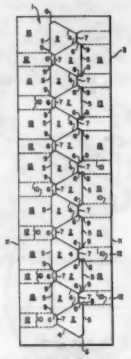


1. A multi-unit dwelling having a plurality of individual living units therein which are protected from noise and visual pollution and which are arranged to afford maximum privacy to each living unit comprising, a plurality of contiguous single floor living units arranged to form a courtyard enclosed on at least three sides therebetween, said courtyard being protected from noise and visual pollution by the plurality of living units, said plurality of living units physically separating said service side and said vehicles associated therewith from said courtyard, each of said living units having a court side exposed to said courtyard and a service side exposed to vehicle access and the associated noise and pollution associated with vehicles, each of said living units including on a single floor level a living area and a bedroom area disposed on said court side of said living unit and a bathroom, a utility room, storage areas, a garage, and a main private entrance way disposed on said service side of said living unit, each of said living units further including a garage disposed on said service side of said living unit, said living area and said bedroom area each including windows therein exposed to said protected courtyard, said bathroom, utility room, garage and storage areas forming a buffer for noise and visual pollution between said service side of said living units and said living area and bedroom area, and wherein said garage of each of said living units includes a vehicle entrance therein opening to said service side of said living units and a garage private entrance way from said garage, to said associated living unit.

4,345,408
BUILDING STRUCTURE

Paul A. Cote, 504 Cambridge Bldg., 10024 Jasper Ave., Edmonton, Alberta, Canada (T5J 1R9)

Filed Jul. 29, 1980, Ser. No. 173,287
Claims priority, application Canada, Jun. 10, 1980, 353835
Int. Cl.³ E04H 1/02
U.S. Cl. 52—169.3 8 Claims

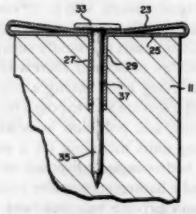


1. A row house structure habitable by humans, comprising a plurality of contiguous similar housing units defining a row of such units, at least two contiguous units being generally similarly triangular in plan, with the base of one triangular unit facing oppositely from the base of the other triangular unit and the two contiguous triangular units having a contiguous side, said row including a pair of end units, each end unit having one free side and a side contiguous with an adjacent unit, each side of any other unit in said row being contiguous with a side of an adjacent unit, and at least one access door in each housing unit.

4,345,409
BRACE MEMBER AND WALL STRUCTURE

Donald E. Schroeder, and Thomas Temperly, both of Milwaukee, Wis., assignors to Inryco, Inc., Chicago, Ill.

Continuation of Ser. No. 955,102, Oct. 26, 1978, abandoned.
This application Nov. 7, 1979, Ser. No. 92,084
Int. Cl.³ E04C 3/12, 3/18
U.S. Cl. 52—693 4 Claims



1. In a structure having a pair of parallel frame members and a plurality of parallel, spaced-apart support members extending between said frame members, the improvement comprising:

a brace member comprising a strip of sheet metal formed to have a generally T-shaped cross section comprising a double layered top member portion having a top layer and a bottom layer, portions of said strip adjacent the edges of said strip extending away from the bottom layer of said top member portion in a substantially perpendicular direction with respect to said top member portion to provide a pair of spaced apart flanges, said flanges being unconnected at their respective outwardly extending edges;

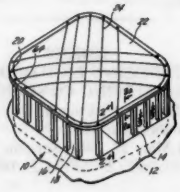
a transverse channel in each of a selected plurality of adjacent ones of said support members and said frame members, said channels being aligned in the diagonal direction across said structure to receive said brace member and sized to receive said brace flanges; and

means for fastening said brace member to said structure, said fastening means having a shank portion extending through said top brace member portion, said shank extending between said brace flanges to engage said support member at the bottom of said channel, said shank being sized to expand said brace flanges outwardly to wedge against the walls of said channels and secure said brace member to said structure members.

4,345,410
CONSTRUCTION METHOD

David Geiger, Rye, N.Y.

Filed Aug. 18, 1980, Ser. No. 178,803
Int. Cl.³ E04B 1/34
U.S. Cl. 52—741 17 Claims



1. A method for erecting the supporting wall of a dome structure comprising the steps of forming a peripheral foundation for the wall conforming in plan generally to the periphery of the structure, positioning hollow box columns on said foundation at predetermined points, securing the lower ends of each of said columns to said foundation at a plurality of points about each column with temporary moment connections to resist load moments during the erection procedure, securing wall panels to said columns between the columns to close the sides of the structure; securing a supporting ring to the tops of said columns, releasing said temporary moment connections at the lower ends of said columns and thereafter erecting the dome on the ring.

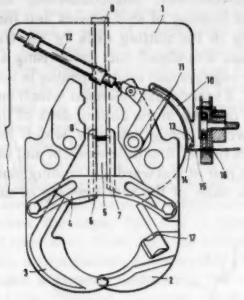
4,345,411
APPARATUS FOR TRANSFERRING SAUSAGE HANGER LOOPS INTO A CLOSING MACHINE

Herbert Niedecker, Am Ellerhang 8, D 6240 Königstein 2, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,783
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950603
Int. Cl.³ B65B 61/14
U.S. Cl. 53—134 3 Claims

1. In an apparatus for closing about the mouth of a filled sausage casing a closure clip having two legs, the apparatus including a plate provided with a clip guideway, means on the plate for gathering the casing, a closure die, a punch for advancing a clip through the guideway about the gathered casing and against the die to cause the clip to be closed about the casing, and means for introducing a loop of flexible material having two connected side portions so that the loop is locked to the sausage casing by the closure of the clip, whereby the sausage may be hung by the loop, the improvement wherein said loop introducing means comprises means for forming loops from a length of flexible material, and pusher means for successively engaging each loop, means operatively associated with the punch for moving said pusher so as to advance the

loop as the punch and clip advance and to bring the loop into such position intercepting the guideway that one leg of the clip



moved by the punch passes between said side portions and through the loop, whereupon the pusher means is retracted and the clip proceeds to closure.

4,345,412

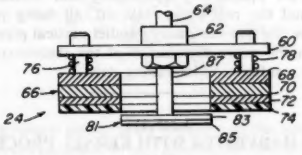
CUP LIDDING APPARATUS AND LEAKPROOF CUP

Winton E. Balzer, 963 Central Ave., Needham, Mass. 02102, and Kenneth M. Knobel, 37 Percy Rd., Lexington, Mass. 02173

Filed Jun. 13, 1980, Ser. No. 159,294

Int. Cl.³ B67B *3/04*; B65B *51/14*, *7/28*

U.S. Cl. 53—297 **4 Claims**



1. In a cup lidding apparatus having a fixed housing adapted to contain a feed roll of heat sealable film, film advance means for drawing the leading end of said film from said roll into a heat sealing horizontally extended position above a cup, cup holding means mounted below the extended film and adapted to raise said cup up into contact with the lower face of said film and then lower said cup and a heat-sealing head mounted to said housing above the extended film and opposite said cup holder and adapted to reciprocate down against the upper surface of said film to heat seal the extended film against the rim of said cup, the improvement, comprising

(a) an annular heat sealing head formed with a central opening extending entirely through said head and presenting a flat lower annular face adapted to engage the upper surface of said film and seal the lower surface against the rim of said cup while isolating the center portion of said film from the heat of said head, and,

(b) said head including resilient material therein,

(c) said head including a thermally insulating member mounted in the center of said head and extending downwardly from the lower face of said head to thermally insulate the center portion of said film from said annular face.

4,345,413

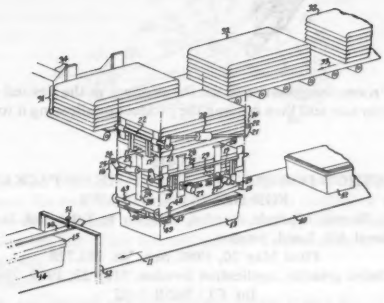
BOX LIDDING SYSTEM AND APPARATUS

Stephen C. McCranie, Woodstock, Ga., and Andrew J. Houseman, Jacksonville, Fla., assignors to Sav-A-Stop Incorporated, Jacksonville, Fla.

Filed Oct. 4, 1979, Ser. No. 81,790

Int. Cl.³ B65B *7/28*

U.S. Cl. 53—315 **16 Claims**



1. In a continuous system for placing a plurality of removable rectangular lids with depending flanges respectively on open top rectangular boxes comprising:

(a) a continuously moving generally horizontal conveyor adapted to move said open top boxes through a lidding station in a preselected orientation to receive respective said lids;

(b) a vertical chute positioned above said conveyor at said lidding station for maintaining a stack of lids in horizontal orientation corresponding to said open top boxes;

(c) at least four spaced movable fingers attached to said chute with two said fingers supporting each of opposed sides of said stack of said lids when inserted below the bottom lid in said stack, means to connect all of said fingers together for simultaneous retraction to a position providing no support for said stack;

(d) at least four spaced movable tongues attached to said chute above said fingers with two of said tongues insertable on each of opposed sides between the bottom lid and the next-to-the-bottom lid in said stack to support opposed sides of said lids resting on and above said tongues, means to connect all of said tongues together for simultaneous retraction to a position providing no support for said stack;

(e) pneumatic power means to selectively move said tongues simultaneously to their inserted position; and

(f) pneumatic power means to selectively move said fingers simultaneously into their retracted position after said tongues are in their inserted position to release said bottom lid onto an open top box in said lidding station.

4,345,414

SHAPING PROCESS

Alan Bornat, and Roy M. Clarke, both of Liverpool, England, assignors to Imperial Chemical Industries Limited, London and University of Liverpool, Liverpool, both of, England

Filed Nov. 15, 1979, Ser. No. 94,799

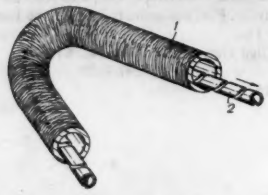
Claims priority, application United Kingdom, Nov. 20, 1978, 45297/78

Int. Cl.³ B29C *25/00*

U.S. Cl. 53—425 **24 Claims**

1. A process for stabilizing a product at least a portion of which comprises electrostatically spun fibres which process comprises the steps of holding the product under stress in a

desired shape and/or size while the temperature thereof is maintained between the melding temperature of the said fibres



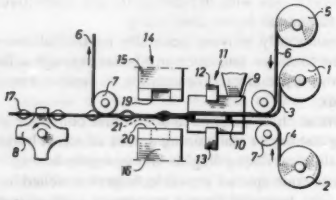
and room temperature to set the product in the desired shape and/or size and then cooling the product or allowing it to cool.

4,345,415

METHOD FOR THE MANUFACTURE OF PACKAGES FOR DRINKING STRAWS

Erik Järund, Morhult, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed May 20, 1980, Ser. No. 151,728
Claims priority, application Sweden, May 23, 1979, 7904547
Int. Cl.³ B65B *9/02*
U.S. Cl. 53—450 **4 Claims**



1. A method for the manufacture of bandlike coherent packages for drinking straws, comprising the steps of placing a plurality of drinking straws transversely between two material webs constituted of thermoplastic films, heat sealing the two material webs to one another around each drinking straw to form closed protective envelopes, heat-sealing a material strip to a side of one of the films remote from the drinking straws, thereby creating transverse sealing regions situated between the drinking straws, removing portions of the sealing regions from the material webs located between the drinking straws together with the material strip so that the protective envelopes are joined together only along limited portions of their peripheral edges.

4,345,416

VACUUM GRASS COLLECTING APPARATUS

George R. Cameron, 3616 Rexford La., Sarasota, Fla. 33583

Filed Oct. 6, 1980, Ser. No. 193,968
Int. Cl.³ A01D *35/26, 35/22*
U.S. Cl. 56—13.3 **4 Claims**

1. A vacuum grass collecting apparatus for a tractor-type lawnmower having a rear discharge opening in its cutting deck and a rear power-take-off, comprising:

(a) a refuse container having an intake opening;

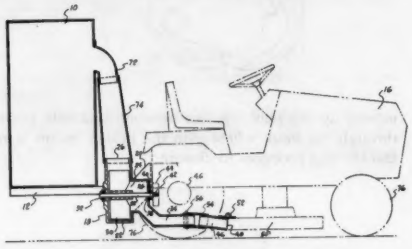
(b) means for mounting said refuse container on the rear of the tractor-type lawnmower;

(c) a blower consisting essentially of a housing having an intake opening and a discharge opening, a rotatable drive shaft having a plurality of impeller blades mounted thereon and a support bearing for said rotatable drive shaft;

(d) means for mounting said blower on the rear of the tractor-type lawnmower;

(e) a duct interconnecting said intake opening in said refuse container and said discharge opening in said housing of said blower;

(f) an articulated duct, positioned under the rear axle of the tractor-type lawnmower, interconnecting said intake opening in said housing of said blower and the rear discharge opening in the cutting deck of the tractor-type lawnmower, said articulated duct comprising a first duct element which engages said intake opening in said housing of said blower, a second duct element which engages the rear discharge opening in the cutting deck of the tractor-type lawnmower, a hinge assembly which bridges the bottom surfaces of said first duct element and said second duct element, a pair of rearwardly extending plates fixedly attached to the sides of the rear opening of said second



duct element to slideably engage the outside surfaces of the sides of said first duct element adjacent to its front opening, and a flexible rubber strip which bridges the top surfaces of said first duct element and said second duct element; and

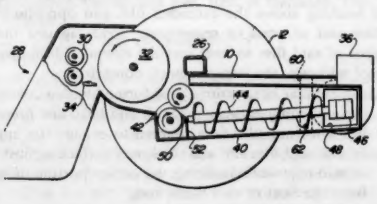
(g) means for operatively connecting said rotatable drive shaft of said blower and the rear power-take-off of the tractor-type lawnmower; said refuse container, said means for mounting said refuse container, said blower, said means for mounting said blower, said ducts, and said means for operatively connecting said rotatable drive shaft and the rear power-take-off, all being positioned between the two imaginary parallel vertical planes which contain the outer extremities of the tractor-type lawnmower, exclusive of its cutting deck.

4,345,417

FORAGE HARVESTER WITH KERNEL PROCESSING MEANS

Harold E. deBuhr; Walter W. Booker, both of Ottumwa, and Steven L. Schmid, Agency, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 17, 1981, Ser. No. 235,314
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—14.3 **1 Claim**



1. A forage harvester having a fore-and-aft mobile frame, crop-gathering means carried at a fore part of the frame for gathering corn crops from the field, including stalks, leaves, ears and husks, crop discharge means at an aft part of the frame, a rotary cutterhead carried by a fore part of the frame

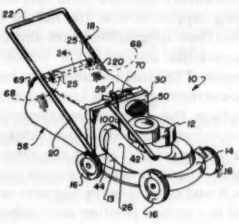
just aft of the gathering means for rotation on an axis transverse to the fore-and-aft centerline of the frame for receiving crops from the gathering means and for chopping the crops into fragments, and a drive source carried by the frame, characterized in that a pair of cooperative compressor rolls is carried by the frame aft of the cutterhead for receiving chopped crops from the cutterhead and for further reducing the crops, said rolls being rotatable on parallel axes parallel to the cutterhead axis, one roll being an upper roll located immediately behind a rear part of the cutterhead, the other roll being a lower roll offset below and forwardly of the upper roll and just under the bottom rear part of the cutterhead so that the cutterhead discharges directly and immediately into the bite of the rolls, fore-and-aft conveyor means having a fore part projecting below the upper roll and in close proximity to the lower roll to receive crops from the rolls and to convey them rearwardly, a substructure is removably carried by the frame and includes a bottom underlying the rolls and conveyor means and the rolls and conveyor means are carried by the substructure so that the substructure, rolls and conveyor means are removable from and installable in the frame as a unit, and drive means is connected between the power source, the cutterhead, the rolls and the conveyor means.

4,345,418

DISPOSABLE BAG MOUNTING AND SHUTDOWN MECHANISM FOR ROTARY LAWN MOWER

Ramiro Arizpe, 9938 Donegal, Dallas, Tex. 75218

Filed Feb. 20, 1981, Ser. No. 236,537
Int. Cl.³ A01D *35/22, 75/20*
U.S. Cl. 56—202 **11 Claims**



1. In a rotary power lawn mower and the like: a housing, motor means mounted on said housing and drivably connected to a rotary mower blade means, said housing including a discharge chute for conveying grass cuttings and debris entrained in a moving air stream generated by said blade means away from said housing, a mounting plate disposed on said mower and including a portion forming a substantially flat surface adapted to form a closure over the mouth of a disposable plastic grass collection bag, a first opening in said plate in flow receiving communication with said discharge chute for discharging grass cuttings directly into said collection bag from said chute, a second opening in said plate for venting air substantially free of debris from said collection bag, a collection bag holder including a perimeter frame member and a flexible tubular bag holding skirt secured at one end to said frame member, said frame member being adapted to be releasably mounted on said plate with the mouth of said collection bag folded over the edge of said frame member for clamping said collection bag between said plate and said frame member;

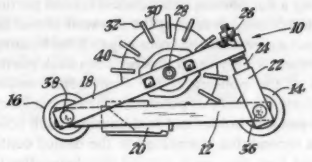
means on said skirt for supporting said collection bag and said skirt at the end opposite said plate whereby said bag holder extends generally horizontally from said plate rearward of said housing, and a movable locking member mounted on said plate and adapted to be moved between locking and release positions with respect to said bag holder for releasably securing said frame member and a collection bag held thereby to said plate for receiving grass cuttings from said first opening.

4,345,419

SELF ADJUSTING, FLOATING, REEL BLADE MOWER

Noel Chandler, 3912 Santiago St., Sebring, Fla. 33870

Filed Mar. 31, 1981, Ser. No. 249,610
Int. Cl.³ A01D *55/20*
U.S. Cl. 56—249 **3 Claims**



1. A reel blade lawn mower that requires no adjustment between the reel blades and the bed knife to establish a variable, predetermined contact pressure for optimum cutting between the reel blade tips and the bed knife cutting surface, comprising:

a frame;

first and second movable support means connected to said frame;

a reel having a plurality of cutting blades affixed thereto disposed about a central reel shaft;

a bed knife attached to said frame;

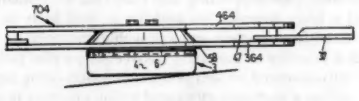
a means connected to the central shaft of said reel and said frame for supporting said reel pivotally against said bed knife, said reel and said reel central shaft support means being configured in weight, size and location to provide a predetermined blade tip contact pressure on said bed knife when freely vertically supported on said bed knife, said pivot located relative to said frame, said bed knife and said reel central shaft to produce an increased contact pressure above said predetermined contact pressure as a function of increased force on said reel blades resisting the motion of said reel blades.

4,345,420

MOWING IMPLEMENT

Pieter A. Oosterling, and Hendricus C. van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Continuation of Ser. No. 832,740, Sep. 12, 1977, abandoned, which is a continuation of Ser. No. 769,775, Feb. 17, 1977, abandoned, which is a continuation of Ser. No. 706,952, Jul. 20, 1976, abandoned, which is a continuation of Ser. No. 536,740, Dec. 27, 1974, abandoned. This application Nov. 5, 1979, Ser. No. 91,167
Int. Cl.³ A01D *55/22, 35/264*
U.S. Cl. 56—295 **2 Claims**



1. A mowing implement comprising, in combination:

an elongate housing of generally rectangular cross section adapted to extend in a direction of movement of the mowing implement, said housing being of predetermined narrow width and of predetermined small thickness whereby to pass over the ground with its top wall angled slightly downwardly but still spaced closely thereabove;

a train of gears disposed in serially meshing relation within said housing, each gear being of a diameter less than said

predetermined narrow width of the housing and of a thickness less than said small thickness of the housing;

a shaft connected to that gear at said one end of the housing and a plurality of further shafts connected to other gears of said train of gears, each shaft projecting upwardly through the top wall of said housing;

a holder connected to each shaft and including a first disc having a flat portion and a dished central portion, said flat portion closely overlying the top wall of said housing and projecting beyond the front edge of the housing whereby to present a very small gap between such portion and top wall of the housing at the front edge thereof so as to preclude the entry of potentially damaging foreign objects between said holder and said housing, each holder including a second disc connected to the dished central portion of said first disc, each second disc being flat throughout and being connected in registry with its first disc so that the peripheries of the two discs are in vertically spaced relation; and

a cutter pivotally connected to each holder between said first and second disc adjacent the periphery thereof and projecting therefrom to sweep a circular path which is larger than the circular path swept by its holder, the circular paths swept by cutter members of adjacent holders overlapping well forward of said front edge of the housing but such cutter members being rotationally staggered with respect to each other so as to prevent interference therebetween.

4,345,421

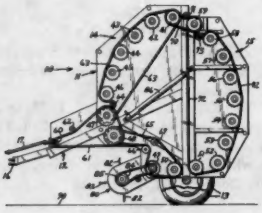
BALING MACHINE WITH A NON-CIRCULAR CHAMBER

Terry R. Schwalenberg, Medford; Frank C. Krumholz, Owatonna; Glenn G. Kanengieter, Blooming Prairie, and Larry L. Henkensiefken, Waseca, all of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Dec. 8, 1980, Ser. No. 214,195

Int. Cl.³ A01D *39/00*; B30B *5/04*

U.S. Cl. 56—341 **11 Claims**



1. A baling machine for forming rolled bales, comprising:

(a) a frame;

(b) means for supporting said frame for movement;

(c) a body mounted on said frame, said body including a fixed front portion and a movable rear portion;

(d) a plurality of generally transverse, parallel rollers rotatably mounted on said body, said rollers being arranged to define a vertically elongated baling chamber in cross-section having an arched upper end and a rounded lower end with an inlet;

(e) means mounted in said inlet of said baling chamber for picking up agricultural material and feeding said material into said chamber;

(f) means for effecting rotation of said roller such that the agricultural material in said chamber is rolled and kneaded into a generally cylindrical bale; and

(g) means for relatively moving the rear portion of said body relative to the front portion for removal of the bale.

4,345,422

HAY-GATHERING MACHINE FOR PULLING WINDROWS, TURNING AND SCATTERING HAY

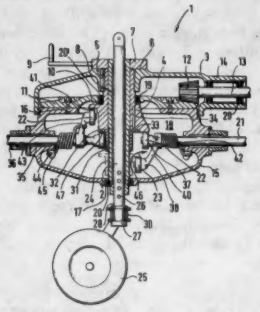
Jean-Pierre Amstutz, Birr, Switzerland, assignor to Bucher Guyer A.G. Maschinenfabrik, Niederweningen, Switzerland

Filed Apr. 28, 1980, Ser. No. 144,259

Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917744; Switzerland, Jun. 8, 1979, 5352/79

Int. Cl.³ A01D *79/00*

U.S. Cl. 56—370 **24 Claims**



1. In a hay-gathering machine for pulling windrows of hay and for turning and scattering the hay, comprising at least one rake-wheel rotating about a substantially vertical swivel axle, wherein rake tines are fastened on a plurality of the tine-carriers which are outwardly directed from said swivel axle, said tine-carriers being supported near the hub of the rake-wheel for rotation about their longitudinal axes and each being provided with a crank-like control lever which cooperatively engages a first control channel to control the rotational movement of the tine-carriers between a lowered and a raised position of the rake tines, the improvement comprising

a second control channel is provided equidistantly about said swivel axle and means to adjust the relative position of said first and second control channels so that in a first position each said control lever contacts said first control channel and in a second position each said control lever is lifted from said first control channel and contacts said second control channel, said second control channel maintaining said tine-carriers in a substantially fixed position.

4,345,423

YARN RESERVE DISC FOR A SPINDLE ASSEMBLY OF A TWO-FOR-ONE TWISTER TEXTILE YARN PROCESSING MACHINE

Wolfgang Leupers, Krefeld, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,447

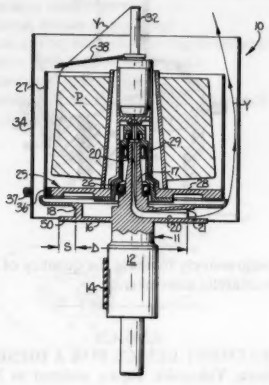
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931369

Int. Cl.³ D01H *7/86*

U.S. Cl. 57—58.84 **2 Claims**

1. In a spindle assembly of a two-for-one twister textile yarn processing machine having a rotatably driven rotor mechanism including a driven whorl, a yarn reserve disc positioned above said whorl and having an outer, circumferential yarn storage surface of predetermined diameter, a hollow axle extending axially from and above said reserve disc, and a generally L-shaped yarn passageway extending axially through said hollow axle and partially through said yarn reserve disc and then radially through said yarn reserve disc and having an exit aperture in said yarn storage surface; the improvement to said yarn reserve disc of means for preventing coils of yarn collected around said yarn storage surface, particularly upon

breakage of the yarn during processing by said spindle assembly, from slipping down off said yarn storage surface onto said whorl which would interfere with proper rotation of said rotor



mechanism, said means comprising an annular rim extending radially outwardly from a lower portion of said yarn storage surface of said yarn reserve disc and having a radial length comprising the relationship:

$$S/D \geq \sqrt{Do/D} \ ;$$

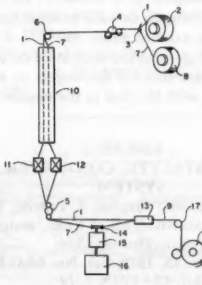
where S=the radial length of said annular rim, D=the nominal diameter of said yarn storage surface of said reserve disc, and Do=an auxiliary dimension of 1 mm.

4,345,424

TEXTURED NOVELTY YARN AND PROCESS

Michael A. Davis, and Bron W. Spivey, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 23, 1980, Ser. No. 161,848
Int. Cl.³ D02B *3/34*
U.S. Cl. 57—209 **6 Claims**



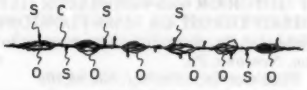
1. A two-phase effect yarn, comprising a first group of lively textured synthetic polymeric continuous filaments and a second group of textured synthetic polymeric filaments, the two groups of filaments being of substantially equal length and combined along their lengths to form a cohesive yarn, and further, slidably attached to each other along portions of their combined lengths, the first group of filaments having alternatingly low and high amplitude characteristics relative to the second group, but substantially no formed slubs along the combined yarn length in a first phase; slubs being capable of being formed in a second phase by exerting sufficient frictional forces along the length of the combined yarn in one direction to cause the two groups of filaments to slide relative to each other until sufficient interfilamentary frictional forces cause a binding action among the filaments.

4,345,425

PROCESS FOR MAKING BULKY TEXTURED MULTIFILAMENT YARN

Takao Negishi, and Kazuo Tomiita, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 13,198, Feb. 16, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,370
Int. Cl.³ D02G *3/34, 1/20;* D02J *1/08*
U.S. Cl. 57—289 **9 Claims**



1. A process for manufacturing a bulky textured multifilament yarn composed of a plurality of individual filaments having false-twisted crimps, having interlaced yarn sections and non-interlaced yarn sections formed alternately along the longitudinal axis of the yarn, and having a plurality of filament portions protruding from the yarn axis, said process comprising at least two steps:

slackening a multifilament yarn treated by a false twisting operation to such an extent that crimps of individual filaments are formed; the crimps of each of said filaments being irregularly distributed along its length as compared to the crimp distribution of other filaments of said yarn;

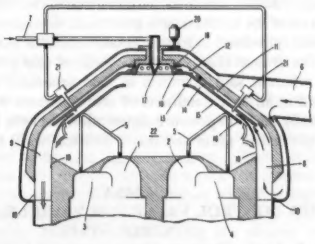
then interlacing said individual filaments of said slackened multifilament yarn by a fluid jet stream while taking up said multifilament yarn, whereby crimps of said individual filaments created by said flase twisting operations are maintained in said yarn during said slackening and interlacing treatment of said yarn.

4,345,426

DEVICE FOR BURNING FUEL WITH AIR

Rolf A. Egnell, Bygatan 17, S-240 13 Genarp, and Carl-Göran Sjöstedt, Tibastgränd 20, S-230 40 Bara, both of Sweden

Filed Mar. 27, 1980, Ser. No. 134,478
Int. Cl.³ F23R *3/04;* F02G *1/04*
U.S. Cl. 60—39.23 **9 Claims**



1. A device for burning fuel with air and in which the combustion gases are at least partially recirculated, said device comprising:

primary walls defining a preheater having adjacent passages for exhaust gases and air supplied for the combustion, said preheater for heating the air and cooling the exhaust gases; secondary walls defining a passage for a first part of the air flow leaving the preheater and for directing said first air flow to a single fuel nozzle; further walls forming

a number of paths for guiding a part of combustion gas flow from a location near said heat exchanger to a location near said nozzle to cause a recirculation of said part of the combustion gases;

still further walls defining ejector nozzles for guiding a second part of the preheated air leaving the preheater into each of said paths to provide the driving force for the recirculation of said part of the combustion gases; and

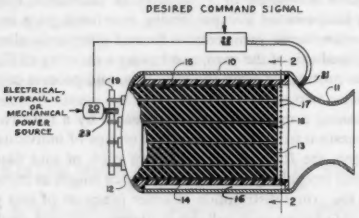
means for indirectly controlling the amount of combustion gases recirculated in said paths, said control means including governing means positioned in said passage for regulating said first air flow.

4,345,427

ROCKET MOTOR OR GAS GENERATOR HAVING CONTROLLED THRUST OR MASS FLOW OUTPUT

Roger H. Whitesides, Jr., Somerville, Ala., assignor to Thiokol Corporation, Newtown, Pa.

Filed Oct. 26, 1979, Ser. No. 88,706
Int. Cl.³ F02K *9/26*
U.S. Cl. 60—234 **2 Claims**



1. A rocket motor or gas generator comprising in combination, a casing including a combustion chamber, a solid propellant grain mounted in said casing, a separator between said grain and the casing, a head closing one end of said casing, at least one opening at the opposite end of said casing, filaments embedded in said propellant, means adapted to retract the filaments during burning of the propellant at various rates to vary its overall burning rate, the separator including walls defining at least one channel in its surface adjacent the casing and port means allowing communication between said channel and said combustion chamber, with each channel arranged longitudinally with respect to the propellant grain, with each channel extended beyond the propellant grain, with the port means comprising at least one passage for each channel and the passage radially oriented with respect to the longitudinal central axis of the motor or gas generator, wherein said propellant grain is cylindrical in form and said separator is annular in form and fits around the cylindrical walls of said propellant grain, and wherein said channels in said separator are uniformly spaced in all four quadrants of said separator to insure a substantially uniform pressure distribution over the burning end of said propellant grain and the cylindrical walls thereof.

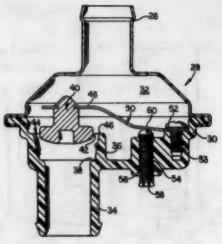
4,345,428

FLOW CONTROL VALVE FOR VEHICLE EMISSIONS CONTROL SYSTEM

John E. Cook, Chatham, Canada, assignor to Canadian Fram, Chatham, Canada

Filed Nov. 20, 1980, Ser. No. 208,614
Int. Cl.³ F01N *3/22;* **F16K** *13/06, 17/40*
U.S. Cl. 60—274 **12 Claims**

1. A method of controlling exhaust emissions in a motor vehicle having an exhaust system including a catalytic converter and a source of air pressure, comprising the steps of communicating the source of air pressure to the catalytic converter, venting at least a portion of the output generated by the source of air pressure when the vehicle is new, and progressively reducing the quantity of air vented as the vehicle is used



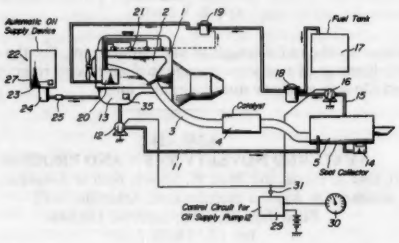
to thereby progressively increase the quantity of air communicated to the catalytic converter.

4,345,429

SOOT TREATMENT DEVICE FOR A DIESEL ENGINE

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Apr. 18, 1980, Ser. No. 141,696
Claims priority, application Japan, Apr. 24, 1979, 54-49656
Int. Cl.³ F02M *25/06*
U.S. Cl. 60—279 **7 Claims**



1. A soot treatment device for a diesel engine which includes an exhaust system, comprising:

a soot collector arranged in said exhaust gas system for collecting soot in exhaust gases; and

means for suspending collected soot in an oil and thereafter mixing said oil into fuel for the engine so as to be again burned together with the fuel in the engine.

4,345,430

AUTOMOTIVE CATALYTIC CONVERTER EXHAUST SYSTEM

John M. Pallo, Englewood; Stephen J. Previte, Littleton, and William Schafer, Lakewood, all of Colo., assignors to Manville Service Corporation, Denver, Colo.

Filed Nov. 15, 1979, Ser. No. 94,413
Int. Cl.³ F01N *7/14*
U.S. Cl. 60—282 **9 Claims**

1. In a vehicular internal combustion engine exhaust system, wherein gases at elevated temperature are exhausted from said engine through an exhaust manifold following combustion and conveyed by said exhaust system from said manifold to the atmosphere, said exhaust system containing a catalytic converter having therein a three-way catalyst through which said gases pass for reduction of their content of unburned hydrocarbons, nitrogen oxides and carbon monoxide, the improvement which comprises:

(a) conduit means joining said exhaust manifold and said converter and through which said gases are conveyed

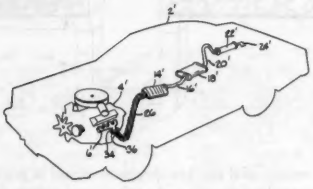
from said exhaust manifold to said converter, said conduit means retaining sufficient heat in said gases such that said gases upon reaching the inlet of said converter are at a temperature above the minimum operating temperature of said three-way catalyst;

(b) said conduit means comprising:

(1) an inner corrugated pipe having an imperforate surface in contact with said exhaust gases;

(2) an outer corrugated pipe;

(3) said inner and outer corrugated pipe each being flexible in all directions;



(4) said inner and outer pipes comprising spirally wound strips of stainless steel;

(5) said outer pipe spaced a predetermined distance from said inner pipe; and

(6) a flexible refractory fiber thermal insulation in said space between said outer and inner pipes so that there is not contact between said outer and inner pipes; and

(c) attachment means associated with said outer and inner pipes for attaching said conduit means to said exhaust manifold and said catalytic converter.

4,345,431

EXHAUST GAS CLEANING SYSTEM FOR DIESEL ENGINES

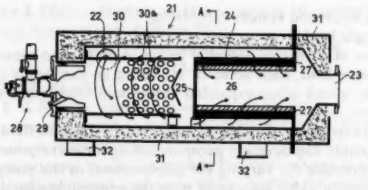
Yoshinobu Suzuki, Narashinoshi; Kiyoshi Chiba, Machidashi; Tomoya Tukuhiro, Kanagawa; Yoshiyuki Iwasawa, Tokyo; Yasuo Kajioka, Tokyo, and Tomio Komine, Tokyo, all of Japan, assignors to Shimizu Construction Co. Ltd., Tokyo, Japan

PCT No. PCT/JP79/00194, § 371 Date Mar. 25, 1980, § 102(e) Date Mar. 25, 1980, PCT Pub. No. WO80/00362, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 26, 1979, Ser. No. 194,244

Int. Cl.³ F01N *3/28, 3/38*

U.S. Cl. 60—286 **2 Claims**



1. An exhaust gas cleaning system for diesel engines employing a hollow housing, said housing being provided with axially disposed inlet and outlet exhaust gas passages at respective ends of said housing; a catalytic bed; a heat resistant filter; said catalytic bed being disposed concentrically within said filter to form a combined assembly; said assembly being positioned at a downstream side within said housing to define a passage in a space between an outer surface of said assembly and an interior wall surface of said housing; wherein; said filter and catalytic bed being laminated to one another and being cylindrically shaped as a hollow assembly; a partition plate; said plate being disposed at the outlet of said assembly to form a closure for separating said inlet and outlet gas passages; a regenerating burner; said burner being affixed to said housing in air tight relation to and in proximity of said inlet passage; said assembly being subjected to hot air from said burner for burning and removing trapped particles from said filter; and said burner being ignited intermittently in response to pressure differential across said assembly due to clogging thereof, as exhaust gas passes through said filter.

4,345,432

EXHAUST GAS PURIFYING SYSTEM FOR INTERNAL COMBUSTION ENGINE

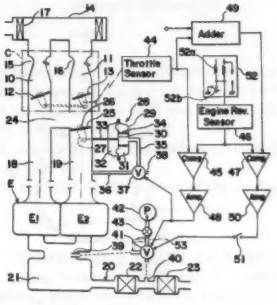
Koso Iida; Hideo Shiraishi, and Haruki Higashi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 16, 1980, Ser. No. 169,488

Claims priority, application Japan, Jul. 16, 1979, 54-98690[U]

Int. Cl.³ F01N *3/22;* F02D *17/02*

U.S. Cl. 60—290 **10 Claims**



1. An exhaust gas purifying system for an automobile engine of a type including a source of combustible air-fuel mixture, a fuel intake system extending between the combustible mixture source and at least first and second engine cylinders, said intake system including a main passage communicated with the combustible mixture source and at least first and second intake passage means communicated at one end with the main passage and at the other end to the respective first and second engine cylinders; and an exhaust passage means communicated at one end with the first and second engine cylinders and at the other end with the atmosphere for the discharge of exhaust gases emitted from the engine as a result of the combustion of the combustible mixture, said exhaust gas purifying system comprising, in combination:

a shutter valve supported inside the first intake passage means for movement between a closed position, in which the supply of the combustible mixture from the combustible mixture source to the first engine cylinder is interrupted, and an opened position in which the combustible mixture from the combustible mixture source is supplied to all of the engine cylinders;

valve operating means for positioning the shutter valve selectively in the closed and opened positions;

a first catalyst unit disposed in the exhaust passage means;

a first air supply means communicated at one end with a source of secondary air and at the other end with a first portion of the exhaust passage means upstream of the first catalyst unit with respect to the direction of flow of the exhaust gases towards the atmosphere;

means for controlling the supply of the secondary air from the secondary air source to the first portion of the exhaust passage means; and

means for causing said valve operating means to position the shutter valve in the closed position by the detection of a decelerated condition of the engine and also for causing the controlling means to operate so as to increase the supply of the secondary air to the first portion of the exhaust passage means by the detection of an engine operating condition in which the load is smaller than a predetermined load which is larger than said decelerated condition.

4,345,433

TRAPPED AIR METHOD OF GENERATING ROTARY POWER IN A DEEPSEA ENVIRONMENT

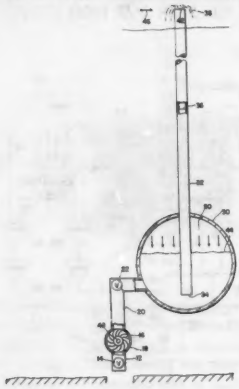
Tad Stanwick, 4715 Upton St., NW., Washington, D.C. 20016

Continuation-in-part of Ser. No. 907,062, May 17, 1978, Pat. No. 4,215,544. This application Dec. 31, 1979, Ser. No. 108,725

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.³ F03B *13/10*

U.S. Cl. 60—327 **3 Claims**



1. Trapped air method of generating deepsea rotary power comprising:

A. supporting a rotatable turbine and sphere containing trapped air in communicant relationship;

B. submerging said turbine and sphere containing trapped air to a deepsea working depth;

C. admitting water at the working depth through said turbine and into said sphere containing trapped air, so as to drive said turbine and compress the trapped air; and

D. bleeding admitted water with an assist from the trapped air from a lower portion of said sphere to a surface location via a flexible conduit extending from the bottom of said sphere to a point adjacent the surface location.

4,345,434

SEA AND OCEAN WAVE ENERGY CONVERTER

Ivan P. Nedyalkov, Sofia, Bulgaria, assignor to Institute Za Yadreni Izsledvaniya I Yadrena Energetika, Sofia, Bulgaria

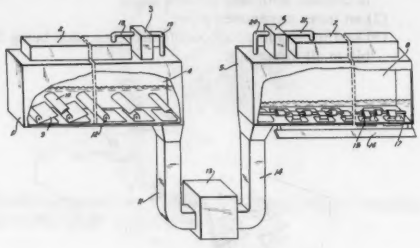
Filed Nov. 5, 1979, Ser. No. 91,247

Claims priority, application Bulgaria, Nov. 3, 1978, 41298

Int. Cl.³ F03B *13/10, 13/12*

U.S. Cl. 60—398 **5 Claims**

1. In a device for converting the energy of sea and ocean waves having a submerged turbogenerator connected by means of pipelines to floating input and output elements on which there are mounted ballast systems and stabilizers, the improvement wherein the input and output elements are designed as a high-pressure vessel and a low-pressure vessel, respectively, with respective gas cushions and comprising a high-pressure compressor unit and a low-pressure compressor unit mounted on the high-pressure vessel and the low-pressure vessel, respectively, and connected to high-pressure and low-pressure gas tanks, respectively, and to respective gas cushions in respective closed circuits, each of said compressor units being operable to transfer gas in both directions between a respective gas tank and gas cushion, input valves in the high-pressure vessel for controlling the flow of water into the high-



pressure vessel, and the low-pressure vessel is provided with an output guiding device and with output valves for controlling the flow of water out of the low-pressure vessel, wherein the said pipelines and flexible hoses, and comprising means for connecting the device at two different points to the sea bottom by means of at least two flexible cords of which at least one may be altered in length.

4,345,435

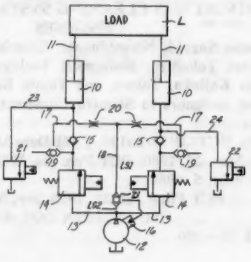
POWER TRANSMISSION

Robert H. Breeden, Metamora, Mich., assignor to Sperry Corporation, Troy, Mich.

Filed May 5, 1980, Ser. No. 146,591

Int. Cl.³ F04B *49/08*; F15B *11/22, 13/06*

U.S. Cl. 60—420 **4 Claims**



1. A hydraulic system comprising

a single load,

a pair of actuators operable to act in parallel to move said single load, each actuator including an expansible chamber which when expanded moves said load in one direction,

each expansible chamber of said actuator having a fluid inlet,

a variable displacement pump including means responsive to a pressure for varying the displacement of the pump,

a meter-in valve associated with the expansible chamber of each actuator for supplying fluid from the pump to its respective actuator chamber,

a meter-out valve associated with the expansible chamber of each actuator for controlling the flow of fluid out of its respective actuator chamber,

a load drop check valve between each said meter-in valve and its associated actuator chamber,

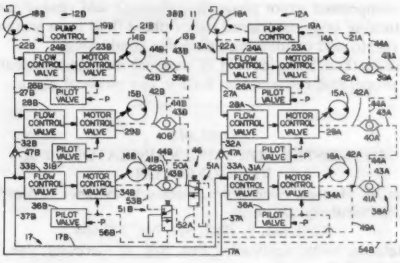
and means for sensing the pressures solely between each said meter-in valve and its associated load drop check valve and applying an average of said pressures to said respon-

sive means of said pump for varying the displacement of the pump.

4,345,436
CONTROL FOR LOAD SHARING PUMPS

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00379, § 371 Date Apr. 7, 1980, § 102(e) Date Apr. 7, 1980, PCT Pub. No. WO81/02914, PCT Pub. Date Oct. 15, 1981
PCT Filed Apr. 7, 1980, Ser. No. 245,238
Int. Cl.³ F15B *11/16, 13/06, 13/09*
U.S. Cl. 60—421 **12 Claims**



1. In a fluid system (**11**) having first (**14A, 15A, 16A**) and second (**14B, 15B, 16B**) pluralities of fluid operated devices, first (**12A**) and second (**12B**) fluid source means for supplying working fluid to said first (**14A, 15A, 16A**) and second (**14B, 15B, 16B**) pluralities of fluid operated devices respectively, first (**19A**) and second (**19B**) control means for varying the outputs of said first (**12A**) and second (**12B**) fluid source means, respectively, in response to control pressures, and crossover means (**17**) for transmitting fluid from said first source means (**12A**) to at least one device (**16B**) of said second plurality of devices (**14B, 15B, 16B**), the improvement comprising:

first pressure comparing means (**38A**) for establishing a two way control pressure flow path between said first control means (**12A**) and the one of a first predetermined group (**14A, 15A, 16A, 16B**) of said devices that is most highly pressurized at a particular time, said first predetermined group (**14A, 15A, 16A, 16B**) including said first plurality of devices (**14A, 15A, 16A**) and at least said one (**16B**) of said second plurality of devices (**14B, 15B, 16B**).

4,345,437
STIRLING ENGINE CONTROL SYSTEM

John J. Dineen, Durham, N.H., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,076
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—521 **10 Claims**

1. A Stirling engine power unit, comprising:

a vessel adapted to hold a working gas under high pressure in a working space;

an external heater for heating the working gas in a hot space of said vessel, and a cooler for cooling the working gas in a cool space of said vessel;

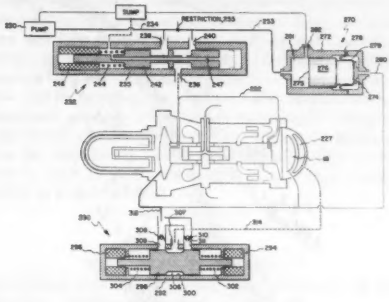
a displacer movable in said vessel to shuttle the working gas between said hot space and said cool space to produce a periodic pressure wave in the working gas;

a first flexible wall having one face sealing the working gas in said working space and flexing in response to said pressure wave;

a first hydraulic chamber adapted to contain a hydraulic fluid and sealed on one side by the other face of said first flexible wall, so that flexing of said first flexible wall causes displacement of hydraulic fluid in said hydraulic chamber;

a power piston having one end in said first hydraulic chamber and movable in response to displacement of the hydraulic fluid in said hydraulic chamber;

a second hydraulic chamber adapted to contain a hydraulic fluid, bounded on one side by the other end of said power piston, and bounded on the other side by one face of a second flexible wall;



a bounce space adapted to be filled with said working gas, said bounce space bounded on one side by the other face of said second flexible wall and on the other side by an interior surface of said vessel;

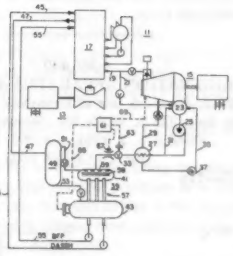
a control plenum in said vessel adapted to be filled with said working gas; and

means for modulating the power of the engine.

4,345,438
DEAERATOR LEVEL CONTROL

Donald E. Labbe, Woburn, and Joseph E. Dutremble, Ipswich, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Sep. 2, 1980, Ser. No. 182,957
Int. Cl.³ F01K *19/00*
U.S. Cl. 60—657 **5 Claims**



1. In a steam turbine power plant including a steam turbine and condenser providing condensate to a steam deaerator, the condensate flow being regulated by a flow control valve upstream from the deaerator, a deaerator water level control positioning the flow control valve comprising:

means providing a water level error signal proportional to the difference between the actual deaerator water level and the water level setpoint;

summing means providing a flow demand signal based upon the water level error signal and a turbine load signal; and,

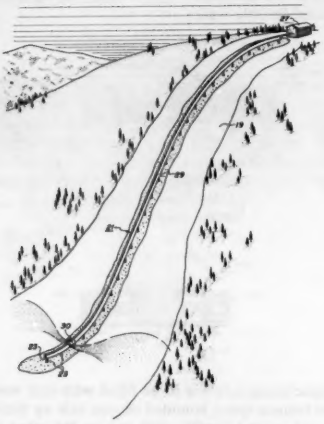
means providing a valve position signal based upon the difference between the flow demand signal and a condensate flow signal.

4,345,439

SNOWMAKING METHOD AND APPARATUS

Robert W. Gundlach, Victor, N.Y., assignor to Vencraft Corp., West Henrietta, N.Y.

Filed Feb. 20, 1980, Ser. No. 122,837
Int. Cl.³ F25C *5/12*
U.S. Cl. 62—71 **7 Claims**



2. A method of providing snow on a ski slope which comprises:

(a) providing a water distribution system along at least one side of said slope;

(b) providing a surface upon which water is deposited at an ambient atmospheric temperature below the freezing point of water along said ski slope from said distrubtion system;

(c) intermittently depositing water from said distribution system onto said surface at a rate such that the water placed on the surface freezes before additional water is deposited on said surface thereby forming a layer of ice on said surface, and;

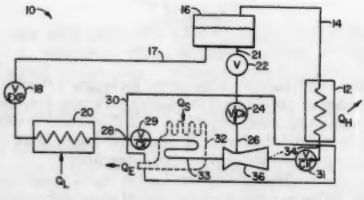
(d) comminuting said ice and distributing the comminuted ice onto said slope.

4,345,440

REFRIGERATION APPARATUS AND METHOD

Reed R. Allen, deceased, late of Sunnyvale, Calif., and by Mary G. Allen, heir, 825 S. Wolfe Rd., Sunnyvale, Calif. 94086

Filed Feb. 2, 1981, Ser. No. 230,248
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—116 **11 Claims**



10. A method for refrigeration comprising:

condensing in a condenser means compressed vaporized refrigeration fluid to a liquid phase to expel heat to a heat sink;

accumulating said condensed liquid phase fluid in a sealed reservoir at substantial equilibrium with said fluid in vapor phase;

adiabatically depressurizing a first portion of said liquid phase fluid from said reservoir;

evaporating in a heat exchanging means said first portion as adiabatically depressurized liquid phase to a vapor phase fluid to draw heat from an environment to be cooled;

introducing said first portion as vapor phase fluid at an inlet of a converging section of a venturi having a converging section, a constrictive throat and a diverging section;

introducing a second portion of liquid phase fluid from said reservoir into said venturi downstream of said throat;

applying sufficient heat to said first portion of said fluid introduced into said venturi to cause said first portion and said second portion upon mixture to be propelled as a compressed vapor phase fluid through said venturi; and

returning said compressed vapor phase fluid from said venturi to said condensing means for condensing;

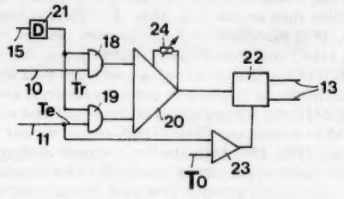
said method being devoid of external mechanical input to propel said refrigeration fluid in any physical phase.

4,345,441

DEFROSTER FOR THE EVAPORATOR OF A REFRIGERATOR

Borge M. Hansen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 5, 1981, Ser. No. 222,668
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1980, 3001019
Int. Cl.³ F25D *21/02, 21/06*
U.S. Cl. 62—140 **1 Claim**



1. A refrigerator assembly comprising, thermostat and compressor means, an evaporator, a frost sensor spaced a predetermined distance from said evaporator corresponding to a permissible frost layer thickness, a second sensor abutting said evaporator for measuring evaporator temperature, evaporator defroster means, first comparator means monitoring said sensors to turn on said defroster means when said evaporator temperature equals the temperature of said frost sensor, second comparator means overriding said first comparator means monitoring said second sensor and a reference ice melting point temperature to maintain said defrosting means in an off condition while said evaporator temperature exceeds said melting point temperature, and means enabling said first comparator means each time said thermostat means initiates actuation of said compressor means.

4,345,442

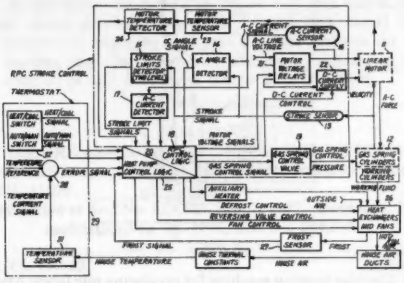
CONTROL SYSTEM FOR RESONANT FREE-PISTON VARIABLE STROKE COMPRESSOR FOR LOAD-FOLLOWING ELECTRIC HEAT PUMPS AND THE LIKE

Richard A. Dorman, Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,306
Int. Cl.³ F25B *13/00;* **F04B** *49/06*
U.S. Cl. 62—160 **8 Claims**

1. A resonant piston compressor control system for use in controlling automatically the operation of a resonant piston

compressor of the mechanically resonant free-piston type driven by an electrodynamic linear motor wherein the spring-mass resonant piston system of the compressor is forced into vibration by the linear motor and is arranged to have a selectively variable mechanical resonant frequency generally centered on the power line frequency of the alternating current power source supplying the linear reciprocating motor, the resonant frequency of the spring-mass resonant piston system being varied by varying the stiffness of enclosed volumes of gas comprising resilient gas spring means that communicate with a reservoir of gas at higher pressure than the gas spring means, means selectively interconnecting the resilient gas spring means with a gas spring pressure control manifold and a gas spring pressure control valve means that can be selectively opened and closed to regulate the pressure of the gas in



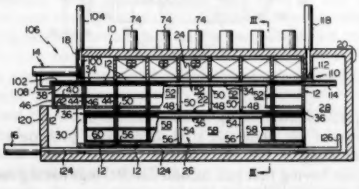
the gas spring pressure control manifold and the stiffness of the resilient gas spring means; said control system comprising control circuit means including alternating current sensing means for deriving a sensed alternating current signal representative of the phase and magnitude of the alternating current supplied to the linear reciprocating motor, resonant piston displacment/velocity sensing means for deriving a stroke signal representative of the resonant piston velocity, α angle detector means responsive to the output from said alternating current sensing means and said resonant piston displacement-/velocity sensing means for comprising the phase of the alternating current supplied to the linear reciprocating motor and the resonant piston velocity and deriving an output α angle control signal for controlling the voltage value of the alternating current supply voltage to the linear reciprocating motor for controlling the output capacity of the compressor.

4,345,443

APPARATUS FOR LOWERING THE TEMPERATURE OF ARTICLES

Shunroku Yamashita, Takatsuki, Japan, assignor to Kibun Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,283
Claims priority, application Japan, Feb. 16, 1980, 55-18160
Int. Cl.³ F25D *25/04*
U.S. Cl. 62—380 **6 Claims**



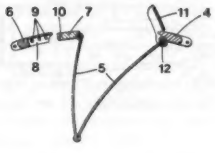
1. An apparatus for lowering the temperature of articles in order to cool, supercool or freeze the articles, comprising: a low temperature box, said box having separate walls therein and dividing said box into a plurality of small chambers, said walls each having at least one opening therein for passage therethrough of the articles to be cooled, said separate walls being spaced from each other along an article conveying path at predetermined intervals with the openings therein aligned; means for lowering the temperature in each of said small chambers to a desired temperature; and article conveying means for conveying articles along said article conveying path through said openings, said article conveying means including a plurality of successive containers for receiving the articles and each having a forward end wall and a rear end wall substantially the same size as said openings, said intervals between said separate walls being substantially a whole number of times the space between said forward and rear end walls of said containers, and advancing means for intermittently advancing the containers through said box with the containers arranged in at least one row, and for stopping the containers with said end walls of the containers generally close to and substantially filling the openings of said separate walls, whereby leakage of cooled gas between the chambers is substantially prevented and the temperature in each of said small chambers can be accurately controlled to a desired value.

4,345,444

METALLIC BRACELET

Jacques-Hubert Gay, Geneva, Switzerland, assignor to Gay Freres S.A., Geneva, Switzerland

Filed Sep. 22, 1980, Ser. No. 189,137
Claims priority, application Switzerland, Oct. 1, 1979, 8825/79
Int. Cl.³ A44C *5/08, 5/24*
U.S. Cl. 63—4 **9 Claims**



1. A bracelet and extension apparatus comprising
(a) a link portion having articulated links of generally rectangular form and generally equal length arranged in adjoining rows of side links and middle links,
(b) an end piece having the external appearance of said side links and of at least one said middle link,
(c) said end piece being situated at one of the extremities of said link portion,
(d) a slide slideably moveable within the middle part of the end piece, and
(e) slide piece securing means for securing the slide piece in a chosen one of several possible positions in said end piece in order to adjust the bracelet to the wrist, adjacent ones of said positions being spaced from each other by less than the length of one of said links,
(f) the slide piece being adaptable for attachment to a clasp.

4,345,445

FLEXIBLE DRILL CHUCK DRIVE

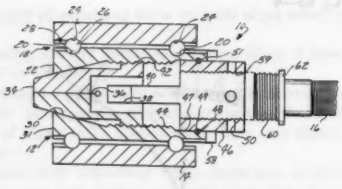
Daniel E. Warthen, 1019 Premont St., Pontiac, Mich. 48053

Filed Jan. 14, 1980, Ser. No. 111,861
Int. Cl.³ F16C *1/02*
U.S. Cl. 279—62 **1 Claim**

1. A flexible shaft drive for drill chucks comprising
a support sleeve encircling the chuck for rotatably supporting the chuck during use;
a bearing means interposed the chuck and the sleeve for rotatably and axially supporting the chuck, the bearing means comprising a first pair of axially spaced arcuate

means comprising a first pair of axially spaced arcuate grooves formed around the chuck perimeter, a second pair of axially spaced arcuate grooves formed inside the sleeve aligned with the first pair of arcuate grooves, a filling notch formed in the support sleeve and the chuck communicating with the grooves to provide a path for insertion of a plurality of balls to support the sleeve in a spaced relationship from the chuck allowing the chuck to freely rotate while the user's hand grasps the sleeve, said balls contacting said sleeves and said chuck perimeter said balls and grooves allowing the sleeve to impose a radial and a thrust load on the chuck while the chuck is rotating;

said chuck further comprising a collet means for releasably grasping tools within the chuck including a tapered bore formed in the chuck, a plurality of tapered jaws having a tapered outer diameter complimentary to the tapered bore, said jaws joined at a large end of the tapered outer diameter, a plurality of axially extending radial slits between jaws, said jaws biased radially outward against the tapered bore so that axial movement of the jaws within the tapered bore causes radial movement of the jaws so that a tool may be radially grasped or released, a driving notch formed at said large end, a drive tang supported in a bushing bore engaging said driving notch, a threaded diameter formed along an outside diameter of the jaws, a



threaded bore formed in the chuck threadingly engaging said threaded diameter so that rotation of said jaws relative to the chuck causes said jaws to displace inward or outward; with said driving notch and said tang providing a positive drive for said collet while allowing axial movement of said collet relative to said tang;

said support sleeve overlaying a substantial portion of said collet means with one of said first pair of axially spaced arcuate grooves positioned adjacent the tool to provide axial and radial tool support as close as possible to the tool;

a bushing bore formed in the chuck;

a driven bushing concentrically supported in the bushing bore, a first retaining groove formed in said driven bushing, a retaining ring slidingly filling said first and second retaining grooves preventing axial movement of said driven bushing relative to said bushing bore and allowing relative rotation between said driven bushing and said bushing bore, and a plurality of radial apertures formed at another end of said driven bushing to rotatingly accommodate an end of a chuck key, said chuck key including a driving gear, a driven gear formed at a rearward end of said chuck meshing with said driven gear; and

wherein rotation of said chuck key in one direction causes said jaws to move radially inward and rotation of said chuck key in a counter direction causes said jaws to move radially outward.

4,345,446

CIRCULAR KNITTING MACHINE FOR PRODUCING HIGH PILE FABRIC HAVING COMBED-IN FIBRES

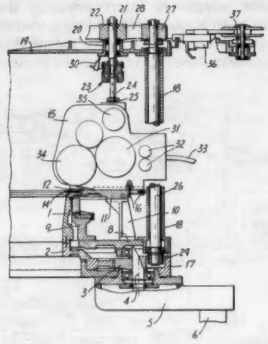
Erwin Schäberle, Gäufelden, Fed. Rep. of Germany, assignor to Sulzer Morat GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 103,091

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853717

Int. Cl.³ D04B *9/14, 35/10;* F16D *7/02*

U.S. Cl. 66—9 B **8 Claims**



1. Circular knitting machine for producing pile fabric having combed-in fibres, comprising a drive motor and at least a carding device which has a drive member being in operative connection with the drive motor for supplying rotary movements to the rotatable parts of the carding device, characterized in that between the drive motor (6) and the drive member (25) there is provided an overload clutch (23) having a driven part (42) and a device (30,63) for automatically stopping the drive motor (6) when the overload condition is reached, that between the drive member (25) and the overload clutch (23) there is provided a coupling (24), and that the coupling (24) and said driven part (42) are the connecting elements of a rapid make or break connection for rapidly connecting or disconnecting said overload clutch and said drive member.

4,345,447

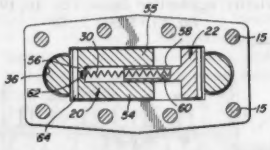
DOUBLE LOCK

Poon C. Keung, 28 Chi Kiang St. G/F., and Yiu Fu, 28A Chi Kiang St. G/F., both of Tokwawan, Kowloon, Hong Kong

Filed Nov. 3, 1980, Ser. No. 203,403

Int. Cl.³ E05B *67/22*

U.S. Cl. 70—38 A **7 Claims**



1. A padlock comprising in combination a

plurality of flat plates secured together to provide a laminated body,

a shackle having first and second parallel legs having respective notches therein,

said laminated body having first and second openings respectively receiving said first and second legs,

a key-operated lock barrel mounted in one end of said laminated body for rotation therein,

first and second locking slides mounted on coplanar relationship in said laminated body for reciprocal movement into and out of said notches,

said first, locking slide being U-shaped and having two spaced apart parallel legs,

said second locking slide being T-shaped and having a leg and crossed top portion,

said leg portion of said second locking slide being slidably disposed between said parallel legs of said first locking slide and guided thereby,

a spring compressed between said first and second slides for urging said slides into said notches,

said spring extending into a hole in the distal end of said leg of said second locking slide,

first and second cam follower surfaces respectively provided on said slides and extending toward said lock barrel, and

cam means drivingly connected to said lock barrel and operatively engaging said cam follower surfaces for retracting said slides from said notches in response to the rotation of said lock barrel in said laminated body.

4,345,448

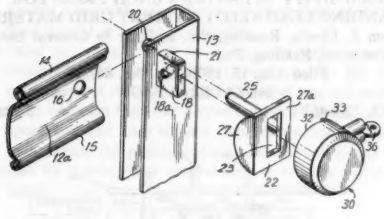
CLOSURE ASSEMBLY WITH PROTECTIVE LOCK

Martin D. Solomon, 243 Beach 122nd St., Belle Harbor, Queens, N.Y. 11694

Continuation of Ser. No. 829,593, Sep. 1, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,651

Int. Cl.³ E05B *65/08*

U.S. Cl. 70—95 **8 Claims**



1. A gate locking system for securely closing an opening comprising

a pair of opposed channeled guide tracks, one of said tracks having a fixed ear extending therefrom with an aperture through said ear and having a hole therethrough adjacent said ear;

a gate movable within said tracks between open and closed positions; said gate including at least one recessed portion with an aperture therethrough;

a bracket having a flat plate with a slot therein for receiving said ear, a pin extending perpendicularly from one surface of said plate adjacent said slot, and a barrier member extending from said plate in a plane substantially perpendicular to said plate and from said one surface thereof; said bracket being placed on said one track so that said ear extends through said slot to expose said ear aperture, said pin extends through said gate aperture and said track hole to lock said gate, and said barrier member extends across a portion of the mouth of said one track and engages said gate recessed portion to lock said gate and block access to said pin when said gate is in said closed position; and

a lock within which said ear is received with a portion of said lock extending through said ear aperture to secure said bracket to said track;

whereby the engagement of said pin with said gate aperture and said track hole constitutes a primary locking mechanism, and the engagement of said barrier with said recessed portion of said gate provides a back-up locking mechanism as well as blocking access to said pin.

4,345,449

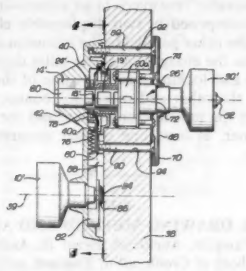
HIGH SECURITY CYLINDRICAL BORED LOCK

Richard O. Mullich, Burbank, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Dec. 17, 1979, Ser. No. 104,299

Int. Cl.³ E05B *55/00*

U.S. Cl. 70—153 **9 Claims**



1. An offset knob security assembly for use with a cylindrical bored lock of the type having a lock cylinder which cooperates with a cylinder spindle to retract a latch bolt and an outer spindle surrounding the cylinder spindle, said outer spindle cooperating with an inner knob to also retract said latch bolt, wherein said lock cylinder, cylinder spindle, outer spindle and inner knob are located on a first axis, said security assembly comprising:

an outer knob located on a second axis which is offset from said first axis;

a first cam connected to the outer spindle;

a second cam connected to the outer knob; and

a pair of parallel pushrods coupling the second cam to the first cam, whereby rotation of said outer knob will rotate said second cam and impart rotation to first cam and outer spindle through one of said pushrods, wherein the offset arrangement between the outer knob and the lock cylinder and cylinder spindles isolates the lock cylinder and spindles from outside manipulation despite removal of the outer knob.

4,345,450

REVERSE EXTRUSION PRESS

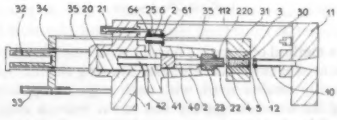
Michel Doudet, Epone, France, assignor to Secim, Courbevoie, France

Filed Nov. 2, 1977, Ser. No. 847,942

Claims priority, application France, Nov. 10, 1976, 76 33870

Int. Cl.³ B21C *23/00, 23/21, 27/00*

U.S. Cl. 72—273.5 **4 Claims**



1. An indirect extrusion press for tubes comprising: a fixed support and a fixed crosspiece; a tubular ram mounted on said fixed crosspiece and supporting a die centered on an extrusion axis; a movable crosspiece movable along said extrusion axis between said fixed support and said fixed crosspiece; a container, provided with a bore for a billet, engagable on said ram and movable between said movable crosspiece and said fixed crosspiece; a needle for piercing the billet and extrusion of the tubes, mounted on the movable crosspiece in the extrusion axis; a closing bottom of the container mounted on the movable crosspiece and comprising, with respect to the container, a

cylindrical extension capable of being enclosed in the bore for ramming of the billet and having a length greater than the elongation of the billet during piercing; a main jack for the displacement of the movable crosspiece and of the container toward the ram; at least two auxiliary jacks attached to the support and connected, respectively to the movable crosspiece and to the container by the operating rods parallel to the extrusion axis; and at least one means of connecting the container with the movable crosspiece in an adjustable position, defined by a jack comprised of two displaceable elements, one with respect to the other parallel to the extrusion axis along a length greater than the elongation of the billet during piercing, control means and locking means for one of these elements with respect to the other and means for connecting one of these elements to the movable crosspiece and the other element to the container, at least one of said connecting means being detachable.

4,345,451

WIRE DRAWING METHOD AND APPARATUS

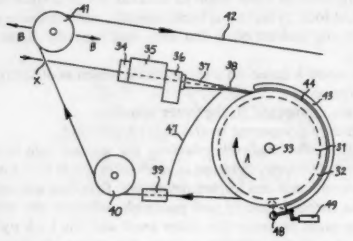
John W. Pamplin, Auckland; Brian R. Astbury, and Richard Shillito, both of Crook, all of England, assignors to Marshall Richards Barcro Limited, Crook, England

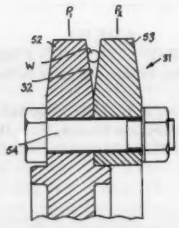
Filed Dec. 10, 1979, Ser. No. 101,561

Claims priority, application United Kingdom, Dec. 12, 1978, 48053/78; Jan. 30, 1979, 7903285; May 8, 1979, 7915881

Int. Cl.³ B21C *9/00, 3/14, 1/04, 1/14*

U.S. Cl. 72—286 **26 Claims**





1. In a method of drawing ferrous wire employing a plurality of drawing stages for continuously drawing the ferrous wire to successively smaller sizes, with each stage comprising a wire drawing die for reducing the size of the wire, a soap box upstream of the die having a dry wire lubricant for lubricating the ferrous wire for drawing the wire to a smaller size and a rotatable drawing wheel downstream of the die operable to draw the wire through the die, the improvement wherein said method comprises, at each of a plurality of successive drawing stages, drawing the ferrous wire through the respective die with the respective drawing wheel by wedging the wire within a peripheral circular wedging groove of the drawing wheel for less than one turn therearound, the circular wedging groove being coaxial with the axis of rotation of the drawing wheel, and continuously conducting a water based, liquid coolant into contact with the ferrous wire along the wire path from the die to the drawing wheel and while the wire is within the wedging groove of the drawing wheel, and drying the wire between each upstream drawing wheel and downstream soap box of said plurality of successive drawing stages.

13. In a wire drawing apparatus having a plurality of drawing stages for continuously drawing wire to successively smaller sizes respectively, with each drawing stage comprising a wire drawing die for reducing the size of the wire, a soap box upstream of the die having a dry wire lubricant for lubricating the wire for drawing the wire to a smaller size and a rotatable drawing wheel downstream of the die operable to draw the wire through the die, the improvement wherein in each of a plurality of successive drawing stages of the drawing apparatus, the drawing wheel comprises a peripheral circular wedging groove, coaxial with the axis of rotation of the drawing wheel, for wedging the wire within less than one turn around the wheel for drawing the wire with the drawing wheel through the respective die, and wire cooling means for continuously conducting a water based coolant into contact with the wire along the wire path from the die to the drawing wheel and while the wire is within the wedging groove of the drawing wheel, and wherein the apparatus comprises an air wipe for drying the wire between each upstream drawing wheel and downstream soap box of said plurality of successive drawing stages.

4,345,452

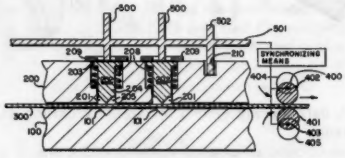
CAM SHAFT OPERATED PUNCH PRESS FOR EXPANDING LEAD ALLOY BATTERY GRID MATERIAL

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Aug. 15, 1979, Ser. No. 66,797

Int. Cl.³ B21D *28/20*

U.S. Cl. 72—452 **5 Claims**



1. A punching apparatus comprising:

a. support means for supporting a material to be punched thereon;

b. biased punch means above said support means, said biased punch means comprised of:

(i) a top plate above said support means said top plate having a plurality of horizontally aligned openings therethrough,

(ii) punch means slidably mounted within each said opening and said top plate, and

(iii) biasing means engaging said punch means for forcing said punch members upwards within said openings;

c. cam means engaging said punch means for operating said punch means, said cam means comprised of:

(i) a rotary punch cam drive shaft above said aligned openings, and

(ii) a plurality of cam members eccentrically mounted on said punch cam drive shaft, one cam member above each opening, and engaging said punch members within said openings;

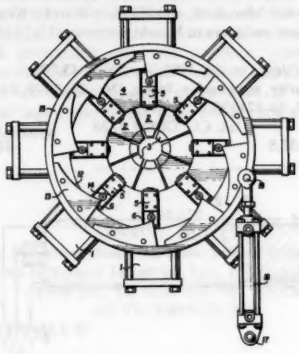
d. moving means adjacent said support means and said material to be punched for moving material to be punched across said support means synchronously with the motion of said cam means.

4,345,453

HYDRAULIC PRESS

Jorma Lillbacka, SF-62300 Härmä, Finland

Filed Oct. 5, 1979, Ser. No. 82,389
Claims priority, application Finland, Apr. 17, 1979, 791227
Int. Cl.³ B21J 9/12
U.S. Cl. 72—453.18 **10 Claims**



1. An improved press, comprising:

at least one hydraulic cylinder for moving at least one jaw of the press;

a control valve for said at least one cylinder, said valve having a movable spool for controlling flow of hydraulic fluid to said at least one cylinder;

at least one control cam having a cam surface, said cam being adapted for movement transverse to the axis of movement of the piston of said at least one cylinder;

at least one cam follower connected between said movable spool and said cam surface, whereby movement of said cam adjusts the position of said control valve; and

means for moving said control cam to actuate said control valve.

4,345,454

COMPENSATING WELL INSTRUMENT

Robert L. Brown, Buena Park, Calif., assignor to AMF Incorporated, White Plains, N.Y.

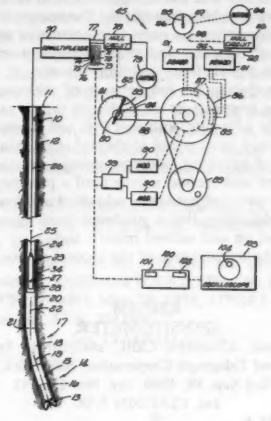
Filed Nov. 19, 1980, Ser. No. 208,236
Int. Cl.³ E21B 47/024
U.S. Cl. 73—1 E **23 Claims**

20. The method comprising:

lowering into a well a probe having sensing means responsive to changes in inclination of an axis of the probe or the direction of that inclination;

rotating said probe about said axis;

taking different readings from said probe in different rotary positions thereof; and



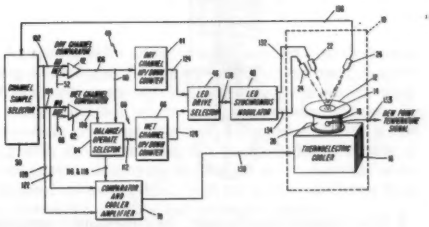
determining the accuracy of said sensing means by noting variations in said readings.

4,345,455

DEW POINT HYGROMETER WITH CONTINUOUS BALANCING SYSTEM

Stanley B. Hayes, Jr., Norfolk, Mass., assignor to EG&G, Inc., Wellesley, Mass.

Filed Mar. 28, 1980, Ser. No. 135,127
Int. Cl.³ G01N 25/68
U.S. Cl. 374—20 **8 Claims**



1. A dew point hygrometer for determining the dew point of a gas sample comprising:

a. only one light sensor;

b. first and second light sources;

c. first and second reflective surfaces positioned to reflect light from said first and second light sources, respectively, to said light sensor;

d. means for cooling said second reflective surface; and

e. circuit means responsive to said light sensor for controlling the operation of said cooling means and for selectively driving said first and second light sources.

8. A method of determining the dew point of a gas sample exposed to first and second mirrors, comprising the steps of:

maintaining said first mirror and said second mirror in close physical and thermal proximity;

positioning first and second light sources to reflect light off said first and second mirrors, respectively, into a single light sensor;

selectively supplying first and second signals to said first and second light sources, respectively, to illuminate said first and second light sources;

producing respective third and fourth signals from said light sensor responsive to illumination of said light sensor by said first and second light sources;

adjusting said first and second signals to said first and second light sources, while maintaining the temperature of said mirrors above the dew point temperature of said gas sample, to establish a selected relationship between said third and fourth signals from said light sensor;

thereafter, reducing the temperature of said second mirror below the temperature of said first mirror while correspondingly adjusting both said first and second signals to maintain said third signal at the value established during said step of adjusting, and continuing to reduce the temperature of said second mirror until a predetermined difference is detected betweeen said third and fourth signals, thereby indicating that a predetermined amount of dew has formed on said second mirror; and

measuring the temperature of the second mirror.

4,345,456

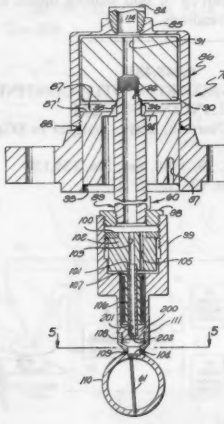
DENSITOMETER

Joseph J. Ponzi, Alhambra, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 186,892

Int. Cl.³ G01N *9/00*

U.S. Cl. 73—32 A **8 Claims**



1. In a vibration densitometer, the combination comprising: a probe having a body; a magnetostrictive member mounted in said body in a position with its ends fixed to said body; means mounted in said body to vary magnetic flux through said member in a manner to cause it to expand and to contract alternately along a drive axis, said expansion and contraction causing said body to vibrate; a hollow cylinder having an external cylindrical surface with a symmetrical axis; connection means mounting said cylinder on said body in a position such that said symmetrical axis is normal to said drive axis, vibration of said body causing vibration of said hollow cylinder, said connection means having a hollow interior providing free and open communication from an exposed portion of the said external cylindrical surface of said cylinder through said body; a piezoelectric crystal bonded to said exposed portion; and a rectangular vane having two parallel edge portions fixed to said cylinder at positions 180 degrees therearound with respect to each other, said cylinder having at least one slot therethrough through which one of said two edge portions projects to a position in engagement with said crystal, said vane lying approximately in a plane through said symmetrical axis at a predetermined angle ϕ relative to said drive axis, said connection means being sealed to said body and sealed to said cylinder around said exposed portion thereof to prevent fluid from entering said body through the said hollow interior of said connection means.

4,345,457

METHOD FOR DETECTING THE DEPTH OF CRACKS IN ROLLS USED FOR TRANSFERRING HOT STEEL INGOT BLOOM AND ROLLS USED THEREFOR

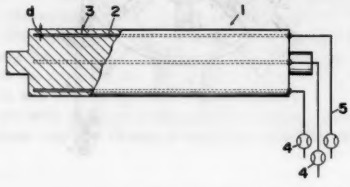
Takanori Kuroki, Munakata, and Hironori Kuroki, Kitakyushu, both of Japan, assignors to Kuroki Kogyosho Co., Ltd., Fukuoka, Japan

Filed Apr. 25, 1980, Ser. No. 143,705

Claims priority, application Japan, Dec. 27, 1979, 54-171782; Dec. 28, 1979, 54-171630

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—37.5 **18 Claims**



1. Method for detecting the depth of cracks in rolls used for transferring hot steel ingot blooms comprising:

(i) supplying a fluid of desired pressure into a plurality of elongated holes formed in said roll, said plurality of elongated holes being disposed below the round outer surface of said roll and extending in a direction parallel to the axis of said roll, and

(ii) detecting the change of the amount of flow of said fluid which is caused by the communication of cracks on said surface with said elongated holes.

4,345,458

WATER TANK ASSEMBLY FOR A PRESSURE RESISTANCE MEASURING APPARATUS FOR TESTING CONTAINERS

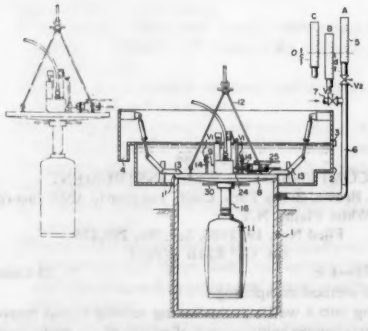
Jiro Kosaka, Zama, Japan, assignor to Meiko Industry Corporation, Limited, Nihonbashi, Japan

Filed Oct. 29, 1980, Ser. No. 201,988

Claims priority, application Japan, Jul. 19, 1980, 55-102256[U]

Int. Cl.³ G01B *13/24*

U.S. Cl. 73—37.5 **2 Claims**



1. A water tank assembly for a pressure resistance measuring apparatus for testing containers comprising:

a vertical water tank;

an auxiliary water tank connected with said vertical water tank at an upper end portion of said vertical tank wherein said vertical tank has a smaller diameter than that of said auxiliary water tank;

a cover attached to said vertical water tank;

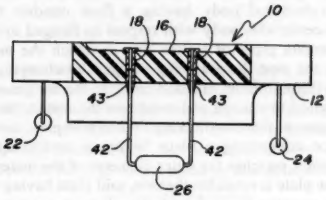
a nozzle assembly connected to said cover wherein a container to be tested is fixed to the lower end of the nozzle assembly, an opening end portion of said vertical water tank protruding into said auxiliary water tank, and wherein said vertical water tank and said auxiliary water tank store water and the water level of said auxiliary water tank is above said upper end portion of said vertical water tank.

4,345,459

SENSING DEVICE

Ralph A. Perry, and James M. Booe, both of Indianapolis, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 17, 1980, Ser. No. 198,058
Int. Cl.³ G01N *25/18*
U.S. Cl. 73—61.1 R 5 Claims



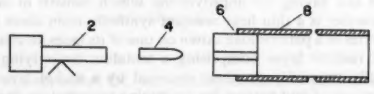
1. In a device for sensing a substance on the surface of a liquid of the type including a floatation means and a sensing element mounted on said floatation means for extending into said liquid, wherein the improvement comprises a plastic encasement enclosing all portions of said element to be exposed to said liquid for preventing interference with the operation of said element by substances in said liquid other than first said substance.

4,345,460

MULTI-CALIBER PROJECTILE SOFT RECOVERY SYSTEM

Herbert D. Curchack, Rockville, Md., and A. David Hahn, Haven Beach, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 11, 1980, Ser. No. 158,556
Int. Cl.³ G01L *5/14*
U.S. Cl. 73—167 6 Claims



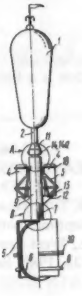
1. A projectile soft recovery system comprising an object placed in the path of said projectile whereby said projectile becomes embedded in said object, and means to decelerate said object with the projectile embedded therein, wherein said object comprises means for accommodating projectiles of varying sizes.

4,345,461

APPARATUS FOR TAKING BEDROCK SAMPLES FROM BOTTOM OF DEEP-WATER BASINS

Georgy M. Lezgintsev, Leninsky Prospekt, 39, kv. 257; Evgeny I. Garbuz, ulitsa Pavla Andreeva, 28, Korpus 7, kv. 431; Evgeny A. Kontar, ulitsa Kropotkinskaya, 9, kv. 2, all of Moscow; Rudolf G. Glukhikh, ulitsa Pavilostas, 7, kv. 7, Latviiskaya SSR, Liepaya; Ivar O. Murdmaa, ulitsa Vavilova, 31, Korpus 1, kv. 96, Moscow; Vadim G. Soluyanov, ulitsa Artema, 59/65, kv. 133, Kiev; Alexandr S. Belyavsky, Altufievskoe Shosse, 24"b", kv. 135, and Alexei N. Kuznetsov, Rublevskoe Shosse, 101, kv. 39, Korpus 2, both of Moscow, all of U.S.S.R.

PCT No. PCT/SU79/00126, § 371 Date Aug. 26, 1980, § 102(e) Date Jul. 10, 1980, PCT Pub. No. WO80/01413, PCT Pub. Date Jul. 10, 1980
PCT Filed Nov. 30, 1979, Ser. No. 199,722
Claims priority, application U.S.S.R., Dec. 26, 1978, 2696400; May 10, 1979, 2766603; May 29, 1979, 2770102; Jul. 23, 1979, 2799894; Sep. 24, 1979, 2811901
Int. Cl.³ G01D *21/00*
U.S. Cl. 73—170 A 14 Claims



1. An apparatus for taking bedrock samples from the bottom of deep-water basins, having a float with a rod and a supporting frame, containers with ballast weights, a device for dropping ballast weights, and a working member, wherein the improvement comprises the working member having a split casing with an open bottom and accommodating a shell; an initiating device destroying said shell at the moment the working member comes in contact with the bottom of a water basis; and a device for catching and holding a sample.

4,345,462

VESSEL LOCATION SYSTEM

Hugo A. Zanutti, Clemson 271-B University Gardens, Rio Piedras, P.R. 00927

Division of Ser. No. 870,610, Jan. 19, 1978, Pat. No. 4,232,391.
This application Jan. 31, 1980, Ser. No. 117,375
Int. Cl.³ G01C *17/00*
U.S. Cl. 73—178 R 10 Claims

1. Sea compass apparatus comprising;

longitude indicator means,

latitude indicator means,

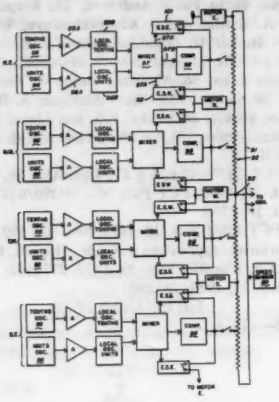
means for driving each indicator means in one direction or the other,

and control means for controlling said driving means including means responsive to vessel speed and vessel direction,

said means responsive to vessel direction including means for registering the direction of travel of the vessel and enabling said drive means to drive the indicator means in a direction of longitude and latitude corresponding to the direction of travel,

said means for registering the direction of travel of the vessel including means for registering the direction of travel of

the vessel in a decimal notation demarcating a position within one of the four quadrants, and means responsive to said decimal notation for driving one of said north and



south motor means and one of said east and west motor means at a speed that is a function of the position in the active quadrant.

4,345,463

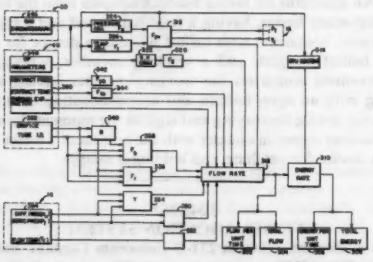
ON-LINE GAS MEASUREMENT AND ANALYSIS SYSTEM

Wayne Wilson, Houston, Tex.; George Rosko, Toms River, and James R. Patmore, Neptune, both of N.J., assignors to Electronic Associates, Inc., West Long Branch, N.J.

Filed Apr. 22, 1980, Ser. No. 142,670

Int. Cl.³ G01N *31/06*; G01K *17/06*

U.S. Cl. 73—190 CV **14 Claims**



1. A system for measuring on line the total energy and total fluid flow of a gas mixture within a pipeline having widely varying component compositions and widely varying flow rates copmrising:

gas chromatograph means for producing time varying signals related to the component compositions of the gas mixture within the pipeline,

programmable gain means coupled to said gas chromatograph means having a plurality of gain ranges, said programmable gain means having comparative means for selecting a gain range for optimum resolution and for producing a related gain range signal,

means for converting to digital form the output of said programmable gain means,

transducer means for measuring the pressure and temperature of said gas mixture within the pipeline, and

control means coupled to said transducer means, said converting means and said gain range means for producing energy and flow rate signals of the gas mixture in the pipeline based on the on-line pressure, temperature, and component gas composition within a range related to the gain range signals.

4,345,464

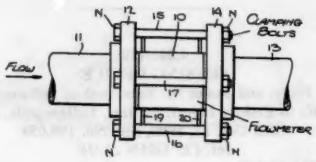
CENTERING DEVICE FOR FLOWMETERS INTERPOSED IN FLOW LINE

Peter J. Herzl, Morrisville; Harold W. Metzger, Willow Grove, and Richard L. Crumley, Southampton, all of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Oct. 31, 1980, Ser. No. 202,733

Int. Cl.³ G01F *15/18*

U.S. Cl. 73—201 **9 Claims**



1. A caming device for a flowmeter or other instrument having a cylindrical body having a flow conduit therein adapted to center this body with respect to flanged upstream and downstream pipes of a flow line in which the meter is interposed, the pipe flanges being bridged by clamping bolts which pass through holes in a bolt circle in the flanges and act when tightened to encage and compress the meter, the holes having clearances therein allowing limited bolt play, said camming device comprising a plate having a central aperture whose diameter matches the outer diameter of the meter body whereby the plate is rotatable thereon, said plate having means to facilitate rotation thereof, said plate having a symmetrical array of camming edges that tangentially engage the bolts such that when the device is rotated on the meter body it acts to force the bolts to their extreme hole positions, as a result of which the body is caused to assume a position concentric with the bolt circle and centered with respect to the pipes.

4,345,465

PROBE FOR MEASURING FLOW RATE AND/OR TEMPERATURE OF A FLOWING MEDIUM

Heiko Gruner, Gerlingen, and Heinz Friedrich, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,713

Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919433

Int. Cl.³ G01F *1/68*

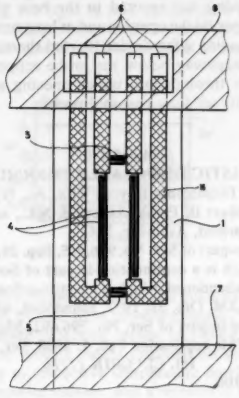
U.S. Cl. 73—204 **6 Claims**

1. A probe for measuring the rate of flow and/or temperature of a flowing medium, suitable for measurement of air and/or fuel intake flow of internal combustion engines, said probe having at least one temperature dependent resistor provided on a carrier disposed in a flow channel or duct of a fluid medium and having the improvement which consists in that:

said carrier is a thin heat-resistant synthetic resin sheet and carries in a pattern load down on one of its faces an electrical resistor layer comprising a tantalum layer lying directly on said resin sheet overlaid by a nickel layer in portions of said pattern for producing temperature dependence of resistance, said pattern being extended so as to provide conducting paths, for connecting resistors, said paths comprising extensions of the said tantalum layer directly lying on said resin sheet completely overlaid in said extended pattern with said nickel layer;

said carrier and said layers thereon are covered by a second heat-resistant thin synthetic resin sheet (2), except for

connection contact locations of said connecting paths serving at least one resistor provided by said resistor layer, which locations are left free by said second sheet, said second sheet being sealed and bonded to said carrier substantially everwhere where said carrier is not covered by the resistors (4,5) formed by said resistor layer and by said conducting paths (16), and



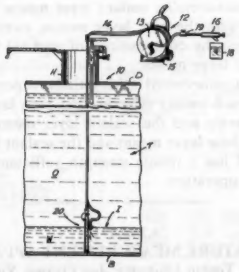
the carrier and its layers and covering sheet are held in two spaced locations in a mechanical self-supporting holder (7,8,14,15) which leaves free cavities (9) for lead connections to said contact location in such a manner that said flowing medium (11) has unimpeded heat conducting access to the regions occupied by said at least one resistor.

4,345,466

APPARATUS FOR OBTAINING SAMPLES AT VARIOUS LEVELS FROM WITHIN A MULTI-LIQUID CONTAINER PRIMARILY FOR DETERMINING THE LEVEL OF THE LIQUID INTERFACE AND RELATED METHOD

N. Lewis Lesser, 536 Ridgewood Ave., Glen Ridge, N.J. 07028

Filed Dec. 20, 1979, Ser. No. 105,564
Int. Cl.³ G01F *23/04*
U.S. Cl. 73—298 **19 Claims**



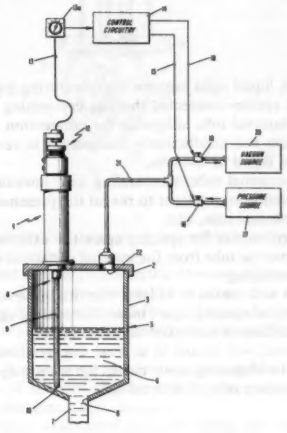
1. An apparatus for determining the level of the liquid interface from within a multi-liquid container having a passageway leading therein, said apparatus being adapted for use with a sampling bob connected by a flexible tube to an elevated location with respect to such container, said apparatus comprising:
(a) a frame,
(b) clamp means for removably attaching the frame to the container,
(c) positioning means slidably mounted for vertical movement relative to the frame,
(d) means for temporarily fixing the sampling bob tube at any point along a substantial portion of its length to the positioning means, and
(e) means on the frame for retaining the positioning means at various vertically spaced locations,
whereby, when the positioning means is shifted to various vertically spaced locations, the sampling bob is similarly shifted to various vertically spaced locations through substantially the entire height of the container.

4,345,467

HIGH TEMPERATURE PRESSURE TRANSDUCER SYSTEM

Charles E. Carlson, Succasunna, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 15, 1980, Ser. No. 187,121
Int. Cl.³ G01F *23/18*; B22D *17/32*
U.S. Cl. 73—309 **6 Claims**



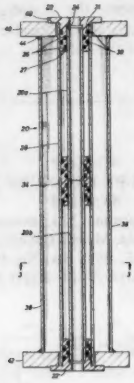
1. A pressure transducer for measuring the combined gas and hydrostatic pressure at a selected level in a liquid pool in a closed vessel, comprising:
sensor rod means extending into the pool through a top wall portion of the vessel and having a submerged sensing surface which senses the total combined pressure acting on said sensing surface resulting from hydrostatic pressure of said liquid pool and gas pressure exerted on the pool;
housing means sealingly supporting said sensor rod means, said housing means including resilient means for restraining radial movement of said sensor rod means but permitting axial movement responsive to changes in sensed pressure;
spring means associated with said housing means and acting upon said sensor rod means, biasing it against axial displacement;
sensing means in cooperation with said sensor rod means for sensing and signaling axial displacement of said sensor rod means; and
sealing means having an end surroundingly attached to said sensor rod means and the other end connected to said housing means to isolate the interior of said vessel from ambient atmosphere, said sealing means being insensitive to gas pressure acting upon it directly from either side.

4,345,468

LIQUID SIGHT MONITOR

William A. Jackson, Houston, Tex., assignor to Jogler, Inc., Houston, Tex.

Filed Oct. 7, 1980, Ser. No. 189,862
Int. Cl.[3] G01F *23/02*
U.S. Cl. 73—326 10 Claims



1. A liquid sight monitor for monitoring liquid presence of a liquid system connected thereto, comprising

an internal tube adaptable for connection to the liquid system and insufficiently transparent to reveal the presence of liquid in the tube,

an external tube surrounding said internal tube and sufficiently transparent to reveal the presence of liquid in said internal tube, and

plural means for spacing apart the external surface of said internal tube from the internal surface of said external tube including

first seal means in at least one first grooved surface of said plural spacing apart means for sealing against the internal surface of said external tube, and

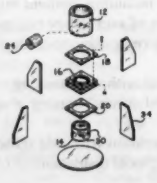
second seal means in at least one grooved surface of said plural spacing apart means for sealing against the external surface of said internal tube.

4,345,469

AIR TUNNEL DEVICE FOR THERMOHYGROMETER

James A. Devine, Norton, and José A. Miletti, Townsend, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1980, Ser. No. 193,772
Int. Cl.[3] G01N *25/62*
U.S. Cl. 73—338.6 1 Claim



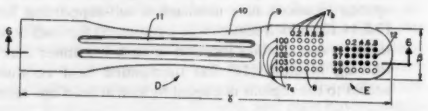
1. In combination with a thermohygrometer instrument for temperature and humidity measurement of the type which includes a temperature/humidity air probe for detecting the temperature and humidity of the ambient air through the change of electrical resistance of the probe, an air tunnel device comprising a housing defining a central air passageway therein, a probe support member for receiving the temperature/humidity air probe of the thermohygrometer instrument and for mounting said probe so the probe is exposed to the air in said air passageway, said housing comprises upper and lower cylinders, a base affixed to the lower cylinder and upright reinforcement members spaced circumferentially about the housing and secured to the base of the cylinders wherein an upper intake opening and at least one lower exhaust opening and having a fan device located therein and disposed in said air passageway below the probe support member for drawing air in through said upper opening so as to create uniform velocity air flow past said probe.

4,345,470

ALL PLASTIC DISPOSABLE THERMOMETER

Craig R. Hof, Hopatcong; Roy A. Ulin, Jr., Wyckoff, both of N.J., and Robert B. Polak, Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 946,935, Sep. 28, 1978, Pat. No. 4,232,552, which is a continuation-in-part of Ser. No. 895,422, Apr. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 844,334, Oct. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 796,492, May 12, 1977, abandoned. This application Feb. 1, 1980, Ser. No. 113,142
Int. Cl.[3] G01K *11/16*
U.S. Cl. 374—106 26 Claims



1. A disposable thermometer device comprising:

(a) suitable non-metallic polymeric heat-conducting easily embossable flexible base layer means having one or more spaced cavities defined therein of about 0.030 to about 0.040 inch diameter and with a depth of from about 0.005 to about 0.025 inch, said cavities being non-elastic, to determine a like number of predetermined temperatures in a predetermined temperature range, with a like number of different thermally responsive compositions of matter associated with one of the predetermined temperatures, said compositions being inert to said base layer means; and

(b) suitable non-metallic sealant layer means in sealing engagement with the base layer means, overlying each of said cavities, the compositions of part (a) being inert to said sealant layer means;

to form a rigid non-vented substantially vapor-impermeable enclosure for each cavity between the base layer walls and floor of said cavity and the sealant layer means, wherein at least one of the base layer means and the sealant layer means is transparent and has a tensile strength sufficient for conventional web-line operation.

4,345,471

TEMPERATURE MEASUREMENT APPARATUS

Fumihiro Endo; Toshio Ishikawa; Jun Ozawa; Yuzuru Kamata, and Shigeo Shiono, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,282
Claims priority, application Japan, May 21, 1979, 54-61453
Int. Cl.[3] G01K *5/62*
U.S. Cl. 374—188 8 Claims

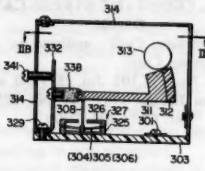
1. Temperature measurement apparatus for use in measuring the temperature of a member located within a closed vessel, comprising:

light emitting means to be disposed outside said closed vessel

for projecting light along an optical path extending through the interior of said closed vessel,

light receiving means to be disposed outside said closed vessel for receiving light from said light emitting means along said optical path, and

temperature detecting means to be disposed on said member which is to have its temperature measured for selectively varying the light on said optical path which reaches said light receiving means including means for selectively intercepting the light in said optical path in steps in response to changes in the temperature of said member from one predetermined temperature level to another, thereby



changing in a stepwise manner the quantity of the light to be received by said light receiving means,

said temperature detecting means including a plurality of temperature sensing means disposed on said member for responding to respective temperature levels of this member in a stepwise manner, and a respective light intercepting means disposed on a respective one of said plural temperature sensing means for changing its position relative to said optical path in response to changes in the temperature level of said member, thereby changing in a stepwise manner the quantity of the light to be received by said light receiving means.

4,345,472

METHOD AND APPARATUS FOR DIGITALLY ANALYZING DYNAMIC UNBALANCE OF A ROTATING BODY

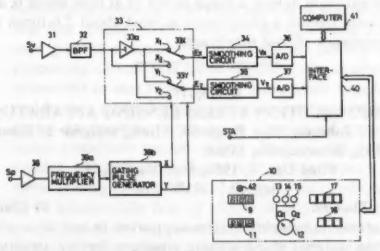
Yoshihumi Hara, Hirakata; Saburo Kubota, Kadoma; Akira Ihara, Kyoto; Masaru Kishimoto, Nara, and Masaki Suzuki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jun. 12, 1980, Ser. No. 158,821

Claims priority, application Japan, Jun. 13, 1979, 54-74818

Int. Cl.³ G01M *1/22*

U.S. Cl. 73—462 **5 Claims**



1. An apparatus for analyzing the unbalance of a rotating body comprising: means rotatably supporting the body to permit vibration thereof under the action of an unbalanced mass in the body, a vibration responsive device operatively associated with the body for generating a periodic signal timed in accordance with the vibration of said body, means for dividing said periodic signal into two vector components having a predetermined phase difference therebetween, means for converting said vector components into corresponding d.c. signals, means for converting said d.c. signals into corresponding digital values, and means for digitally processing said digital values to detect the magnitude and angular location of said unbalanced mass, said means for digitally processing including a computer programmed to calculate the following equations:

$$U_W = k\sqrt{(Vx - a)^2 + (Vy - b)^2}$$

$$\phi_W = \delta^\circ + \tan^{-1}\frac{Vy - b}{Vx - a}$$

where, U_W and ϕ_W are the magitude and the angular location of said unbalanced mass, respectively, and k, a, b, and δ are constants.

4,345,473

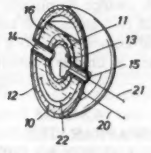
VERTICAL COMPONENT ACCELEROMETER

Albert J. Berni, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 26, 1980, Ser. No. 210,483

Int. Cl.³ G01P *15/09*

U.S. Cl. 73—516 LM **10 Claims**



1. An accelerometer for measuring the vertical component of acceleration comprising:

a first and second hollow piezoelectric element, said second element being disposed within said first element;

mounting means for securing said first and second elements in position and isolating the volume between said first and second elements;

contact means for securing first and second leads to the outer surface of said first element and the inner surface of said second element;

a conductive liquid, said liquid partially filling the volume between said first and second elements; and,

means for coupling a third lead to said conductive liquid.

4,345,474

ELECTROSTATIC ACCELEROMETER

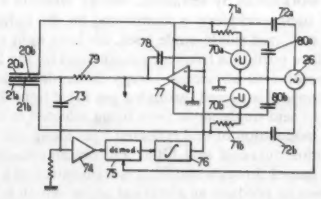
Alain Deval, Plaisir, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM, Paris, France

Filed Apr. 9, 1980, Ser. No. 138,731

Claims priority, application France, Apr. 11, 1979, 79 09213

Int. Cl.³ G01P *15/13*

U.S. Cl. 73—517 B **3 Claims**



1. An electrostatic pendulous accelerometer for measuring

acceleration along a sensing axis, comprising: a stator defining an internal cavity; a pendulum consisting of an electrically insulating disc connected to the stator by hinge means allowing the pendulum to oscillate under the action of accelerations along said sensing axis; a pair of first electrodes formed on the opposite surfaces of said cavity perpendicular to said sensing axis; a pair of second electrodes disposed on the opposite sides of said disc, each confronting one of said first electrodes and in capacitive relation therewith; a detection circuit for detecting unbalance between the capacities of two measurement capacitors each comprising one of the first electrodes and the confronting second electrode, said detection circuit comprising two legs, each leg having a reference capacitor connected to constitute a capacitor bridge with one of said measurement capacitors and a charge amplifier connected to charge said reference and measurement capactors with a constant current; a servo-control circuit which comprises integrating amplifier means connected to receive an electric signal representative of the unbalance of the capacities of said two measurement capacitors and supplying two channels constructed and connected to cause delivery of square voltage pulses to each of the capacitive bridges by the associated charge amplifier depending on the direction of acceleration for rebalance of the pendulum, and a pulse counter connected to count the difference between the number of square pulses applied to the capacitive bridges; and a sequencer alternately supplying pulses for simultaneous energization of both charge amplifiers and pulses for selectively opening one of two gates each transmitting the outputs signals of one of said comparators to a corresponding one of said charge amplifiers, as charge controlled signals.

4,345,475

METHOD AND APPARATUS FOR RECEIVING ULTRASONIC ENERGY BY OPTICAL MEANS

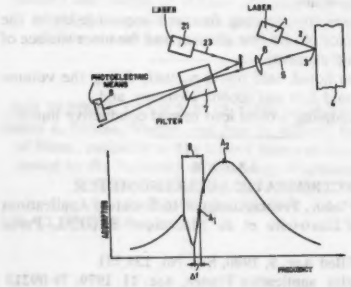
Wolf Bickel, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Nov. 10, 1980, Ser. No. 205,304

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002620

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—657 **8 Claims**



1. The method of optical reception of ultrasonic energy in testing of workpieces by ultrasonic energy wherein a surface portion of such workpiece is illuminated by the light from a frequency stabilized single-mode laser, the laser light reflected at said surface portion is frequency modulated by the Doppler effect responsive to ultrasonic energy deforming said workpiece portion and is passed through a gas filled light filter, the frequency of said single-mode laser being selected to cause an amplitude modulation of said reflected light along the slope of the absorption curve of said filter, and the amplitude modulated light passed through said filter is transmitted to a photoelectric means to produce an electrical signal which is responsive to the intensity of the ultrasonic energy at said workpiece surface portion, the improvement comprising:

illuminating said workpiece portion (3) with a first laser light beam (2);

irradiating the gas in the light filter (7) with a second laser light beam (23) of such intensity that the filter (7) substantially loses its absorption ability for the frequency or frequencies of said second laser light beam (23) to cause in the original absorption region (22) of said filter (7) at least one part region (B) characterized by a steeper slope of the absorption curve.

4,345,476

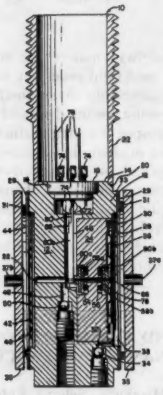
DIFFERENTIAL PRESSURE TRANSDUCER WITH HIGH COMPLIANCE, CONSTANT STRESS CANTILEVER BEAM

Gurnam Singh, Riverside, Calif., assignor to Bourns Instruments, Inc., Riverside, Calif.

Continuation of Ser. No. 172,101, Jul. 25, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 285,238

Int. Cl.³ G01L *9/00*

U.S. Cl. 73—720 **6 Claims**



1. A differential pressure transducer, of the type employing a cantilever beam having piezoelectric strain gauges mounted thereon or diffused therein, a pressure-sensitive diaphragm, and a strut element connecting said diaphragm and said beam in a manner which produces a stress in said beam at said strain gauges in response to a pressure applied to said diaphragm, wherein the improvement comprises:

said diaphragm having a shape factor of at least about 6; and said beam having a compliance at least about 2.6 times the compliance of said diaphragm.

4,345,477

SEMICONDUCTION STRESS SENSING APPARATUS

Russell L. Johnson, New Brighton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 3, 1980, Ser. No. 212,657

Int. Cl.³ G01B *7/18*

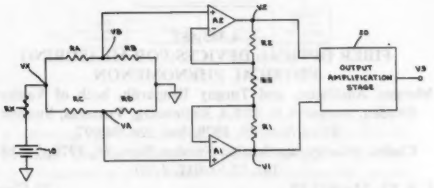
U.S. Cl. 73—766 **59 Claims**

1. A stress transducing system supported in and on a semiconductor material stress sensing structure having structural portions including substantially a diaphragm and a constraint for constraining said diaphragm at peripheral portions thereof, with said structure having a major surface bounding semiconductor material, said semiconductor material being of a first conductivity type except in selected locations thereof, said major surface being common to both said diaphragm and said constraint, said stress transducing system comprising:

a first semiconductor piezoresistive domain in said semiconductor material at a said selected location extending at least in part into said diaphragm, and with said domain

being adjacent to said major surface, said first semiconductor piezoresistive domain having first and second terminating regions, said first semiconductor piezoresistive domain having therein a first distribution of dopant atoms with depth into said semiconductor material away from said major surface which leads to said first semiconductor piezoresistive domain being of a second conductivity type and having a temperature coefficient of resistance of a first magnitude which is effective in a first magnitude direction, said first semiconductor piezoresistive domain being a component part of a stress sensing circuit which is capable of providing a stress sensing circuit first output signal at a stress sensing circuit first output region of a magnitude varying in correspondence to changes in magnitude of stress applied to said diaphragm, said stress sensing circuit first output signal varying with such stress, as aforesaid, in a manner characteristic of said first semiconductor piezoresistive domain and remaining portions of said structure to thereby establish a stress sensing characteristic which characteristic also depends upon temperatures occurring in said structure;

a first semiconductor resistive domain in said semiconductor material at a said selected location and adjacent to said major surface, said first semiconductor resistive domain having first and second terminating regions, said first semiconductor resistive domain having substantially said first distribution of dopant atoms therein leading to said



first semiconductor resistive domain being of said second conductivity type and having a temperature coefficient of resistance of substantially said first magnitude which is effective in said first magnitude direction, said first resistive domain being substantially free of effects in electrical behavior in response to stresses applied to said diaphragm, said first semiconductor resistive domain being a component part of a signal processing circuit having a signal processing circuit first input region which is electrically connected to said stress sensing circuit first output region and having a signal processing circuit output region, said signal processing circuit being capable of providing a stress transducer system output signal at said signal processing circuit output region which is a version of said stress sensing circuit first output signal but as compensated to be substantially free of effects of said temperature dependence in said stress sensing circuit characteristic; and

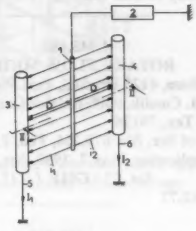
a first primarily resistive domain adjacent to said major surface and supported by said structure, said first primarily resistive domain having first and second terminating regions, said first primarily resistive domain having a temperature coefficient of resistance of a magnitude substantially less than said first magnitude, said first primarily resistive domain being substantially free of effects in electrical behavior in response to stresses applied to said diaphragm and being a component part of said signal processing circuit.

4,345,478

GAS FLOW MEASURING DEVICE

Jean Barat, Verrieres les Buisson, France, assignor to Metraflu, France

Filed Jul. 18, 1980, Ser. No. 169,956
Claims priority, application France, Jul. 18, 1979, 79 18653
Int. Cl.³ G01F *1/64*
U.S. Cl. 73—861.09 **6 Claims**



1. A device for the measurement of a component of the speed vector of an ionizable gas flow utilizing high electrical voltage potential, said device comprising:

a linear section of conducting wire;

means for applying said high electrical potential to said section of conducting wire to produce ions through the corona effect around the periphery of said section of wire;

a pair of linear conductors for collecting the ions produced by said corona effect to generate ion currents, said pair of conductors arranged parallel to said section of wire and equally spaced on opposite sides of said wire; and

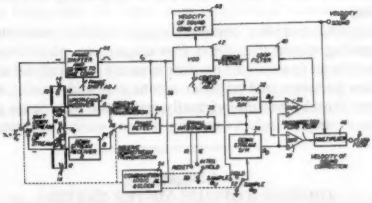
means responsive to the difference in said ion currents generated at each of said pair of conductors as a result of collecting the ions emitted by said section of conducting wire to generate a signal corresponding to the speed vector of the ionizable gas flow.

4,345,479

FLOWMETER SYSTEM WITH SYNCHRONOUS CLOCK FOR GENERATION OF TIMING SIGNALS

Robert S. Loveland, West Covina, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 13, 1981, Ser. No. 224,783
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.28 **8 Claims**



1. A flowmeter system comprising, in combination:

transducer means for transmitting acoustic compression waves upstream and downstream in a fluid flowing in a path;

circuit means for measuring the phase difference between the transducer means in the fluid flow path of the acoustic compression waves transmitted upstream and circuit means for measuring the phase difference between said transducer means in the fluid flow path of the acoustic compression waves transmitted downstream;

circuit means for producing a difference signal dependent on

the difference between the two phase differences, the magnitude and sign of which being directly related to the instantaneous fluid flow rate and its direction;

circuit means for automatically adjusting the frequency of the acoustic compression waves to a frequency where a fixed wavelength distance, in the fluid flow medium, occurs across the path of the transducer means; and

signal generating means for producing timing signals for operating said circuit means which relate in frequency to the frequency of said acoustic compression waves.

4,345,480

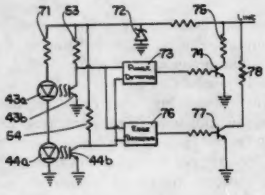
ROTARY FLOW METER

Edward R. Basham, 4125 Driskell, Fort Worth, Tex. 76107, and Helmut R. M. Cmelik, 9008 Ridglea Country Club Dr., #301, Fort Worth, Tex. 76126

Continuation of Ser. No. 879,254, Feb. 21, 1978, abandoned. This application May 7, 1980, Ser. No. 147,634

Int. Cl.³ G01F *1/115*

U.S. Cl. 73—861.77 **6 Claims**



1. An improved axial vane type flow meter for measuring the direction and rate of fluid flow within a borehole, comprising:

an impeller means having a plurality of helical vanes mounted adjacent a sensing means for rotating in response to fluid flow;

said impeller means including a cage freely suspended within said borehole with said vanes being axially positionable within said cage for rotation in closer proximity with one end of said cage than the other for engaging laminar fluid flow therefrom and balancing bidirectional sensitivity;

said sensing means including two light paths and a light interrupter means for digitally sensing rotation and signalling both direction and rate of fluid flow of a duration imparting less than one revolution to said impellers;

said sensing means being longitudinally disposed from said impeller in axial alignment therewith and sealably contained relative thereto and the fluid passing therearound; and

a magnetic coupling connecting said impeller means to said sensing means through a first magnet coupled through a bulkhead to a second magnet to cause longitudinal separation between said impeller means and said sensing means and thereby provide virtually resistance free signal generation subject only to sensing means bearing resistance.

4,345,481

DIGITAL TORQUE METER SYSTEM

Kenneth Schroyer, Slidell, La., assignor to Instruments, Computers and Controls Corp., Slidell, La.

Filed Jun. 3, 1980, Ser. No. 156,055

Int. Cl.³ G01L *3/12*

U.S. Cl. 73—862.34 **13 Claims**

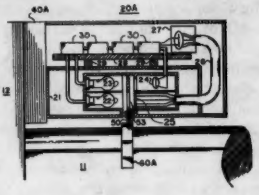
12. A torque meter system for a load transmitting rotating shaft, comprising:

first interrupter means for mounting on the shaft for rotation therewith;

first electro-optical sensor means, having a primary light source and a spaced primary light detector between which said first interrupter means passes and temporarily blocks the light going from said light source to said light detector, for detecting when said first interrupter passes it;

second interrupter means for mounting on the shaft at a longitudinally spaced position on the shaft for rotation therewith; and

second electro-optical means, having a primary light source and a spaced, primary light detector between which said second interrupter means passes and temporarily blocks the light going from said light source to said light detector, for detecting when said second interrupter means passes it; and



electrical circuit means connected to said first and said second electro-optical detector means for comparing the relative times said first electro-optical means and said second electro-optical means detect the passage of said first and second interrupter means, respectively;

said primary light detector including a series of optical glass fibers arranged in a vertical, radial array to form a thin, straight line, light pick-up.

4,345,482

FIBER OPTICAL DEVICES FOR MEASURING PHYSICAL PHENOMENON

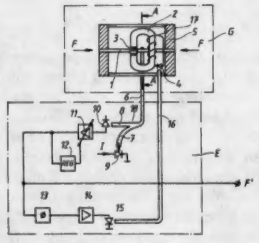
Morgan Adolfsson, and Torgny Brogardh, both of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Nov. 14, 1979, Ser. No. 94,097

Claims priority, application Sweden, Nov. 16, 1978, 7811821

Int. Cl.³ G01L *1/10*

U.S. Cl. 73—862.59 **20 Claims**



1. Fiber optical device for measuring physical phenomenon, comprising:

a transducer unit including an object mounted therein and adapted to oscillatate at a resonant frequency thereof and having a property of oscillation altered in response to a change in physical characteristic of said object induced by stimulus of the physical phenomena being measured, and including at least one light conducting fiber having a fiber optical position/movement detector element mounted in operative association with said object to detect said altered oscillation property;

processing means for generating an output signal representative of the phenemena being measured in response to an output of said fiber optical detector element; and

excitation means for generating energy causing said object to oscillate, and including optical transmission means for

transmitting oscillating energy to said transducer unit, said means for transmitting including at least one light conducting fiber for optically transmitting said oscillating energy.

4,345,483

METERING APPARATUS

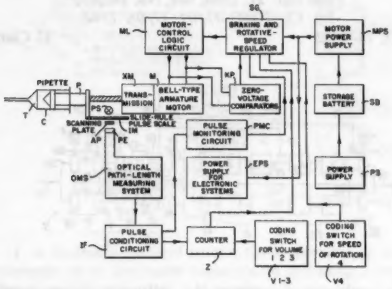
Benno Paletta; Reinhard Möller, both of Graz, Austria, and Joachim Kasielke, Brühl, Fed. Rep. of Germany, assignors to Clinicon International GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 4, 1980, Ser. No. 183,794

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937066

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.16 **22 Claims**



1. In a metering apparatus for liquids, having a motor-driven piston/cylinder system, optical position-determining means including a transparent pulse scale with nontransparent marks and affixed to the piston, an optical/digital measuring circuit which converts the stroke of the piston into a corresponding number of digital pulses, means including a counter for counting the digital pulses for controlling the stroke of the piston on the basis of a preset metering volume, the improvement wherein: the optical position-determining means further comprises a second pulse scale adjacent to the first pulse scale and fixed relative to the cylinder to form a scanning plate, and a light transmitter and a light receiver for the scanning of the marks, and the marks on the pulse scales form a regular line grid; the motor comprises a direct-current motor; and the means for controlling the stroke of the piston comprises means for controlling the speed of rotation of the motor on the basis of the contents of the counter such that when the preselected metering volume is approached the lowest speed level is selected, and braking means for applying a reverse voltage to the motor when the counter position corresponding to the preselected metering volume is reached to permit the motor to be brought to a dead stop.

4,345,484

SAMPLING DEVICE

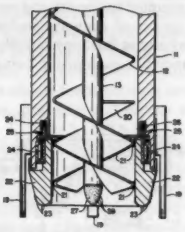
Gregory Gould, 30 Clairmont Ave., Thornwood, N.Y. 10594, and Hendrik Colijn, 423 Franklin Heights Dr., Monroeville, Pa. 15146

Filed Oct. 14, 1980, Ser. No. 196,711

Int. Cl.³ G01N *1/08*

U.S. Cl. 73—864.43 **10 Claims**

1. A sampling device comprising a tubular means, auger means rotatable within said tubular means, cutting means attached to said auger means, said cutting means comprising



circular cutting means having a circumference approximately equal to the circumference to said tubular means.

4,345,485

TEMPORARY LOCKING DEVICE FOR INERTIA WHEEL

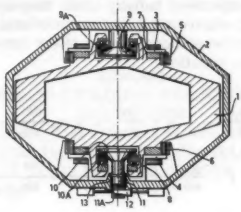
Jean-Luc Livet, Palaiseau, and Maurice Bretaudeau, Fontenay le Fleury, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, France

Filed Mar. 26, 1980, Ser. No. 133,997

Claims priority, application France, Mar. 30, 1979, 79 08013

Int. Cl.³ G01C *19/24*

U.S. Cl. 74—5.1 **11 Claims**



1. Temporary locking device for a rotor of an inertia wheel, sustained with respect to a stator, by magnetic means and associated with two emergency bearings comprising:

a conical bearing surface for each said emergency bearings;

a complementary conical bearing surface for each of said conical bearing surfaces, one of the two conical bearing surfaces being able to come into mechanical contact with said complementary bearing surface, and one of said complementary bearing surfaces being rendered axially movable;

so that said rotor can be immobilised for three degrees of freedom, two radially and one axially, after placing said bearing surfaces in mechanical contact, said rotor remaining free to rotate.

4,345,486

POWER TRANSMISSION HAVING A CONTINUOUSLY VARIABLE GEAR RATIO

Henry T. Olesen, 48-50 Sondergaardsvej, DK-3500 V rlose, Denmark

Filed Mar. 20, 1979, Ser. No. 22,299

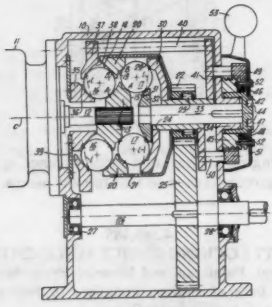
Claims priority, application United Kingdom, Mar. 22, 1978, 11424/78

Int. Cl.³ F16H *15/26*

U.S. Cl. 74—198 **9 Claims**

1. A power transmission for transmitting power from a driving shaft to a driven shaft along a main axis of the transmission and having a continuously variable gear ratio, in which torque is transmitted by friction forces at points of tangency

between balls and runways and wherein the balls and runways are divided into two axially spaced groups, the balls in each group rolling on four runways, two of which runways are rotationally immovable with respect to each other and two of which runways are coupled to the driving and the driven shaft, respectively, each group of runways including at least one radially inner runway and at least one radially outer runway, at least two of the runways in each group being axially displace-



able, the two groups of balls being coupled in parallel, a respective radially inner runway of each group being connected to a respective radially inner runway of the other group to resist relative axial movement of said radially inner runways, and a respective radially outer runway of each group being connected to a respective, radially outer runway of the other group to resist relative axial movement of said radially outer runways, the cross-sectional shapes of the runways being determined by the equations

$$\frac{dy}{dx} = tg\ u; \frac{dy}{dz} = -tg\ v; \frac{dy_1}{dx} = tg\ u_1; \frac{dy_1}{dz} = tg\ v_1 \text{ and}$$

$$f = \frac{\sin u \cdot (y - \cos v)}{\sin v \cdot (y + \cos u)} = \frac{\sin u_1 \cdot (y_1 - \cos v_1)}{\sin v_1 \cdot (y_1 + \cos u_1)}$$

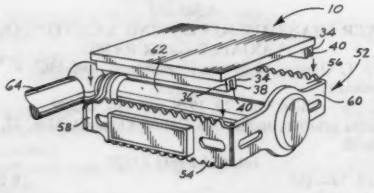
where x and z are the relative axial displacements of the balls and the radially outer and inner runways, respectively, f is the gear ratio of the transmission, y and y_1 are the corresponding variable radial distances of the ball centers from the main axis of the transmission, and u, u_1, v and v_1 are the angles between the ball radii to the points of tangency of the balls and runways.

4,345,487

PROTECTIVE PAD FOR MOUNTING ON A BICYCLE PEDAL

Michael Straker, 771 SW. 15th St., Corvallis, Oreg. 97330

Filed Feb. 19, 1980, Ser. No. 122,450
Int. Cl.³ G05G *1/16*
U.S. Cl. 74—563 **3 Claims**



1. For use on a bicycle pedal having spaced-apart side members, a protective pad for mounting on the pedal comprising:

a pad member having a substantially flat surface for contact by a rider's foot, said pad member being provided with recess means;

coupling means including a gripping means detachably connected to and extending from said pad member, said gripping means being formed of resilient material and provided with projection means for detachable insertion into said recess means, said gripping means also including a slot dimensioned for receiving one of the side members for frictionally engaging opposed surfaces of the side member to thereby mount said pad member on the pedal; and

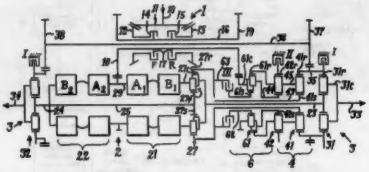
said recess means and said projection means each being configured so that said projection means is frictionally held in said recess means when inserted thereinto and is detachable therefrom by manual force.

4,345,488

HYDROMECHANICAL STEERING TRANSMISSION

Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,033
Int. Cl.³ F16H *47/04, 37/06, 1/44*
U.S. Cl. 74—682 **15 Claims**



1. A multi-range synchronous shifting hydromechanical transmission comprising:

an input drive train;

right and left output multi-element differential gear units each having an output shaft attached to a first said element;

a hydrostatic component including an input member responsive to said input drive train, right and left output members, hydrostatic means responsive to said input member for propelling said right and left output members hydrostatically at independently controlled variable speeds for propulsion and steering, a third output member and means for propelling said third output member hydrostatically at a speed which is the average of the speed of said right and left output members, whereby the outputs of said right, left and third output members can be used for propulsion and a speed difference between said right and left output members can be used for steering;

mechanical means for connecting said right and left output members of said hydrostatic component to a second element of said right and left output multi-element differential gear units respectively;

a mechanical gear train interconnecting said input drive train, said third output member of said hydrostatic component and a third element of said right and left multi-element differential output gear units, said gear train including reduction and differential gearing components and means for selectively actuating said components of said gear train in at least two different combinations of said reduction and differential gearing components for generating and transmitting two different hydromechanical drive speeds to the third elements of said output differential gear units, to cause said transmission to operate in two different hydromechanical ranges, or in a third combination by immobilizing said third elements to lock out said gear train to cause said transmission to operate in a third range, each of said two hydromechanical ranges having a distinct propulsion torque ratio between said right and left output members and said output shafts, said torque ratios

both being different from the torque ratio between said right and left output members and said output shafts when said gear train is locked out.

4,345,489

HYDRAULIC CONTROL SYSTEM FOR SERVOS IN AUTOMATIC TRANSMISSIONS

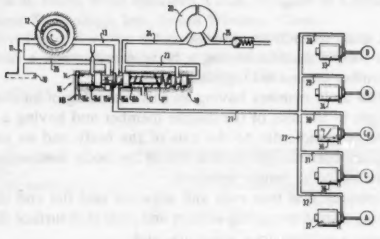
Alfred Müller, Leonberg; Manfred Schwab, Gerlingen; Meinrad Feder, Schwieberdingen; Achim Schreiber, Schwieberdingen, and Joseph Sauer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,993

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2901051

Int. Cl.³ F16H *3/74*

U.S. Cl. 74—752 A **5 Claims**



1. A hydraulic control system for a plurality of switching elements of an automatic transmission including a main conduit, a main pressure valve to regulate the pressure in the main conduit and a torque converter valve, comprising a plurality of electromagnetically actuated pressure regulating valves connected in parallel to said main pressure conduit, each pressure regulating valve having a corresponding variable fluid opening, the variation of said opening being proportional to applied electrical current, and each switching element being connected to the main pressure conduit through one of said pressure regulating valves.

4,345,490

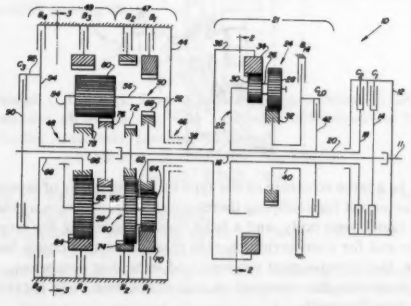
MULTI-SPEED POWERSHIFT TRANSMISSION

Lyle R. Madson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 26, 1980, Ser. No. 134,274

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—761 **13 Claims**



1. A multi-speed powershift transmission for connection to a driven power shaft, said transmission comprising:

(a) a first planetary section comprising a rotatable carrier, planet gear means rotatably mounted on said rotatable carrier, a rotatable sun gear meshing with said planet gear means, a rotatable ring gear meshing with said planet gear means, a rotatable hollow member, connecting means joining one of said sun gear, ring gear and carrier to said hollow member, a brake for selectively preventing rotation of a second of said sun gear, ring gear and carrier, and a clutch for selectively locking the second of said sun gear, ring gear and carrier to the third thereof;

(b) a first drive clutch for selectively connecting the third of said sun gear, ring gear and carrier to said driven power shaft;

(c) a second planetary section comprising first and second relatively rotatable sun gears, first and second relatively rotatable ring gears, a rotatable carrier, planet gear means rotatably mounted on said rotatable carrier and meshing with said sun and ring gears, first and second brakes for selectively preventing rotation of said first and second ring gears, respectively, and the first of said sun gears being connected to said output member of said first planetary section;

(d) a second drive clutch for selectively connecting the second of said sun gears to said driven power shaft; and

(e) a third planetary section comprising an extension of said rotatable carrier of said second planetary section, first and second relatively rotatable sun gears, a rotatable output member connected to said first sun gear, a brake for selectively preventing rotation of said second sun gear, a clutch for selectively locking said second sun gear to said first sun gear, planet gear means rotatably mounted on said rotatable carrier and meshing with said first and second sun gears, a relatively rotatable ring gear meshing with said planet gear means, and a brake for selectively preventing rotation of said ring gear.

4,345,491

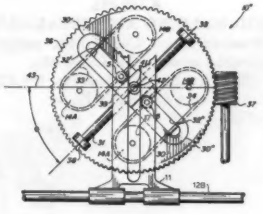
TRANSMISSION UTILIZING VELOCITY CONTROL MECHANISM

Gilbert H. Hannon, 1232 Elizabeth St., Green Bay, Wis. 54308

Filed Jun. 19, 1980, Ser. No. 161,001

Int. Cl.³ F16H *19/06, 35/08*

U.S. Cl. 74—831 **3 Claims**



1. A transmission employing a velocity control device comprising:

a support,

a slotted tool actuating platform mounted for reciprocal movement on said support,

drive means mounted adjacent said platform and connected thereto for causing reciprocal movement of said platform,

said drive means comprises a pair of sprocket means each having an endless means mounted thereon for movement thereby upon rotation of the associated sprocket means,

a pair of following means one mounted on each of said endless means for movement therewith,

a support rod,

a slide bracket laterally positioned across said rod for slidable movement along said rod,

a pair of spacedly positioned axially aligned slots formed in said bracket to extend longitudinally thereof,

each of said slots loosely engaging a different one of said following means for causing said bracket to be reciprocally moved along said support rod over a portion of the travel of said endless means and to be relatively stationary during a second portion of the travel of said endless means when said following means moves along said slots, and

a roller mounted on said bracket for riding in the slot of said platform for moving said platform in a simulating manner.

4,345,492

METHOD OF MAKING METAL FORMING PUNCHES

Emerson D. Spengler, and Charles W. Schaeffer, both of Lebanon, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sep. 18, 1980, Ser. No. 188,414
Int. Cl.³ B21K *5/00*
U.S. Cl. 76—101 R **3 Claims**

1. A method of making a punch for forming metal comprises sequentially the following steps:

(a) providing a cylindrical bar of steel,

(b) cutting a piece from said cylindrical bar,

(c) applying a coating of phosphate and lubricant to said piece,

(d) extruding said piece into a punch for forming metal having a polygonal cross section at one end, a cylindrical cross section at the other end and an intermediate transition portion therebetween, the length of the cylindrical cross section being about the same as the length of the polygonal cross section,

(e) annealing said punch

(f) facing said one end of said punch, and

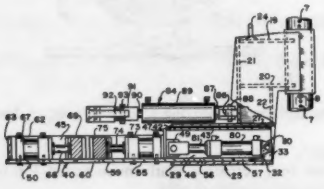
(g) heat treating said punch.

4,345,493

DRILL ROD HOLDING AND BREAK-OUT DEVICE

Charles L. Rassieur, Creve Coeur, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Oct. 22, 1980, Ser. No. 199,428
Int. Cl.³ B25B *13/50*
U.S. Cl. 81—57.34 **8 Claims**



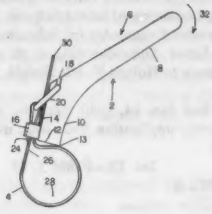
1. In a vehicle mounted rod holding and break-out device the improvement comprising a clamp support, a pair of oppositely disposed clamp jaws mounted on said support, means mounted on said support for moving at least one of said clamp jaws toward and away from the other, a housing for mounting and supporting one end of said clamp support for sliding in and out with respect to said housing, means mounted in said housing and connected to said support for moving said support in in and out directions, and means mounted on said vehicle for pivotally supporting said housing for swinging said housing and support toward and away from said vehicle.

4,345,494

OIL FILTER WRENCH

Norman O. Aamodt, R.D. #5, Coatesville, Pa. 19320

Filed Oct. 28, 1980, Ser. No. 201,421
Int. Cl.³ B25B *13/52*
U.S. Cl. 81—64 **2 Claims**



1. A strap wrench comprising:

(a) a handle portion having a body member and a handle member connected together,

(b) said body member having an axis extending of an obtuse angle to the axis of the handle member and having a flat end perpendicular to the axis of the body and an outer square corner opposite the end of the body member connected to the handle member,

(c) between said two ends and adjacent said flat end there being a strap mounting surface and over that surface there being a retainer loop structure, and

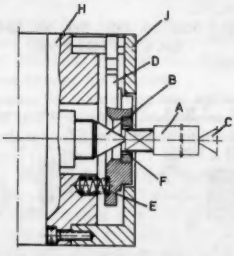
(d) a strap with one end of said strap being fastened to said body member, said strap passing through said retainer loop structure, then said strap forming a loop and passing back through said retainer loop structure under said strap portion already positioned in said retainer loop structure.

4,345,495

LATHE DOG

Erwin Junker, Talstrasse 78, D 7611 Nordrach-Baden, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,197
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942351
Int. Cl.³ B23B *33/00*
U.S. Cl. 82—41 **6 Claims**



1. In a lathe structure of the type including a pair of tapered center points for clamping therebetween a workpiece, a rotatable chuck base body, and a lathe dog for clamping the workpiece and for transferring thereto rotation of said chuck base body, the improvement wherein said lathe dog comprises:

a pendulum disc mounted on said chuck base body for rotation therewith;

means for mounting said pendulum disc on said chuck base body to prevent relative rotation therebetween in either of opposite directions of rotation of said chuck base body about the axis of rotation thereof, and to allow relative

axial movement and relative tilting movement of said pendulum disc with respect to said chuck base body;

a carrier disc connected to said pendulum disc for movement therewith, said carrier disc having therethrough an opening with internal axially inclined surfaces for contacting an end of the workpiece;

one of said center points extending into said opening; and

means operable between said chuck base body and said pendulum disc for urging said pendulum disc and said carrier disc toward the workpiece in the direction of a straight line extending between the contact points of said center points with the workpiece, and thereby for urging said inclined surfaces of said carrier disc into clamping contact with the workpiece.

4,345,496

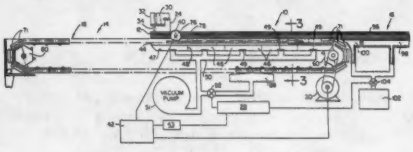
APPARATUS FOR WORKING ON SUCCESSIVE SEGMENTS OF SHEET MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Division of Ser. No. 8,045, Jan. 31, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,871

Int. Cl.³ D06H 7/24

U.S. Cl. 83—100 **14 Claims**



1. Apparatus for working on sheet material comprising a vacuum table having material shifting means for moving sheet material relative to said table, said material shifting means including an endless belt conveyor having a bristle mat including an upper run having upwardly extending bristles defining a movable material supporting surface and a lower run having downwardly extending bristles defining a lower surface of said belt conveyor, said apparatus having a working mode wherein said conveyor is at rest relative to said table and a material moving mode wherein said conveyor relative to said table, said material supporting surface having air passageways, therethrough, means in communication with said passageways in at least a portion of said material supporting surface for applying vacuum to said portion of said material supporting surface, means defining a vacuum chamber below said lower run and having an opening therein adjacent said lower surface for applying vacuum to said lower surface, and means for applying vacuum to said vacuum chamber and reducing vacuum applied to said portion of said material supporting surface during said material moving mode.

4,345,497

FILM SLITTER

Wendall C. Cobleigh; Donald L. Barmore, and Robert C. Geschwender, all of Lincoln, Nebr., assignors to Professional Marketing Associates, Lincoln, Nebr.

Filed Sep. 18, 1980, Ser. No. 188,532

Int. Cl.³ B26D 7/06

U.S. Cl. 83—105 **4 Claims**

1. A film slitter, comprising,

a support means having upper and lower ends, inner and outer ends and opposite sides,

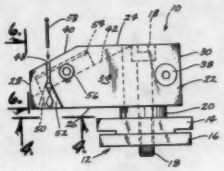
said support means having a central, disposed and elongated first slot formed therein extending downwardly thereinto from the upper end thereof and terminating above the lower end thereof, said first slot being positioned substantially equidistant from said opposite sides,

said support means having a second slot formed therein extending downwardly thereinto from the upper end thereof and extending from said first slot to one of said sides,

said support means having a third slot formed therein extending downwardly thereinto from the upper end thereof and extending from first slot to the other of said sides,

the upper ends of said second and third slots being parallel and aligned,

said second slot having a lower end portion which is angularly disposed with respect to the upper end portion of said second slot,



said third slot having a lower end portion which is angularly disposed with respect to the upper end portion of said third slot,

said lower end portion of said second slot extending towards one of said inner or outer ends of said support means,

said lower end portion of said third slot extending towards the other of said inner or outer ends of said support means,

said support means receiving a vertically disposed blade means in said first slot with the upper end of the blade means will be positioned below the upper end of said support means.

4,345,498

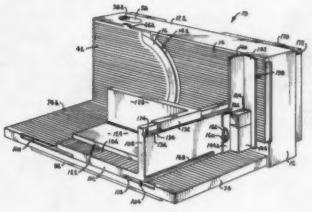
FOOD SLICING MACHINE

Gary R. Best, Jackson County, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Jun. 18, 1980, Ser. No. 160,660

Int. Cl.³ B26D 7/06

U.S. Cl. 83—707 **30 Claims**



1. A food slicing machine comprising:

a housing having a generally vertical guide surface;

a slicing blade mounted on the housing, the blade being rotatable to slice food directed against the blade;

an electric motor coupled to the slicing blade for rotating the blade with respect to the housing;

a platform coupled with the housing for pivotal movement between a folded storage position and a generally horizontal operating position;

a food tray mounted on the platform for sliding longitudinal movement along the platform, the food tray having a table portion for carrying food toward the slicing blade, and a food pusher mounted on the food tray for moving food against the slicing blade; the table portion being disposed between the platform and the guide surface, and at least a portion of the food pusher disposed between the platform

and the housing when the platform is in the storage position; and

a releasable lock on the housing for locking the platform in the storage position.

4,345,499

METHOD FOR THE PRODUCTION OF SAWBLADES, ESPECIALLY JIGSAW OR SABRESAW BLADES

Frank L. Ross, 35 Rygards Alle, DK-2900 Hellerup, Denmark

Filed May 6, 1980, Ser. No. 147,184

Claims priority, application Denmark, May 10, 1979, 19461/79

Int. Cl.³ B27B *33/12*; B23D *63/00*

U.S. Cl. 83—835 **4 Claims**

1. A sawblade, especially a jigsaw blade, characterized by comprising a blade body incorporating a cold swaged relief groove on each side surface thereof and by a cold swaged preformed slot in said blade body, and further characterized by having a toothed insert fastened into said preformed swaged slot.

4,345,500

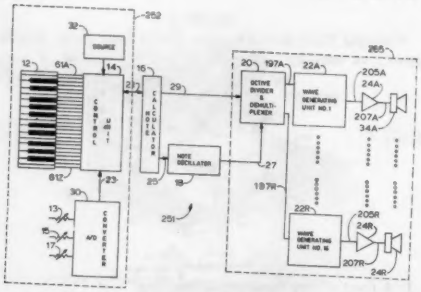
HIGH RESOLUTION MUSICAL NOTE OSCILLATOR AND INSTRUMENT THAT INCLUDES THE NOTE OSCILLATOR

Sydney A. Alonso, Strafford, and Cameron W. Jones, Wilder, both of Vt., assignors to New England Digital Corp., White River Junction, Vt.

Filed Apr. 28, 1980, Ser. No. 144,525

Int. Cl.³ G10H *5/06*

U.S. Cl. 84—1.01 **22 Claims**



1. A digital electronic musical instrument comprising, in combination:

means for selecting at least one desired note having a fundamental frequency, which means for selecting provides a binary output signal;

digital calculator means connected to receive the binary output signal and operable to produce, in binary form, values of a fractional increment number;

digital oscillator means comprising clock means for generating clock pulses at a predetermined periodic repetition rate, adder means having a first adder input and a second adder input respectively to receive a first binary input signal formed of binary bits having whole number significance and the fractional increment number, said adder means having a modulus, an adder sum output and a carry-out output, said adder means being operable to add the first binary input signal and, as a second binary input signal, the fractional increment number, said adder means being operable to provide a carry-out pulse on the carry-out output thereof whenever said modulus is exceeded, the fractional increment number being formed of binary bits, selected ones of which are aligned within the adder means to have a lower order of significance than the bits forming the first binary input signal, accumulator means having an accumulator input and an accumulator output, which accumulator means is connected to receive the clock pulses from the clock means and to receive the adder sum at the accumulator input and being operable to store the adder sum and to provide the stored adder sum at the accumulator output, said accumulator output being connected to provide said first binary input signal to said first adder input, so that an oscillator output is provided in the form of carry-out pulses having a rate proportional to said fractional increment number received by said second adder input; and

means for producing said desired note in response to at least some of the carry-out pulses.

4,345,501

AUTOMATIC PERFORMANCE TEMPO CONTROL DEVICE

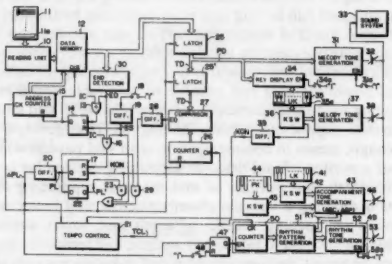
Akira Nakada, Hamamatsu; Eisaku Okamoto, Hamakita, and Kiyoshi Yoshida, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 11, 1981, Ser. No. 272,644

Claims priority, application Japan, Jun. 18, 1980, 55-82507

Int. Cl.³ G10H *1/40*

U.S. Cl. 84—1.03 **8 Claims**



1. An automatic performance tempo control device comprising:

manual performance signal generating means for generating a manual performance signal comprising a plurality of manual timing pulses in accordance with manual performance;

tempo clock signal generating means for generating a tempo clock signal;

tempo control means which receives said manual timing signal and said tempo clock signal, including judgment means for judging whether or not a pluse out of said manual timing pulses has been generated in a predetermined range around the timing determined by said tempo clock signal; and

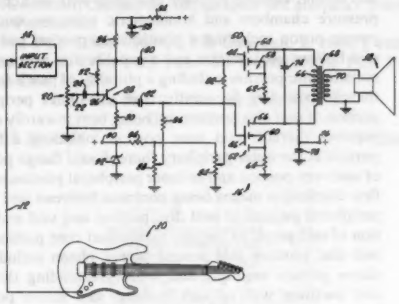
tempo control signal generating means for generating a tempo control signal in accordance with the result of the judgement of said judgement means, said tempo clock signal generating means further receiving said tempo control signal and modifying the frequency of said tempo clock signal in accordance with said tempo control signal.

4,345,502

MUSICAL INSTRUMENT PERFORMANCE AMPLIFIER

Edward R. Jahns, Fullerton, Calif., assignor to CBS Inc., New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,409
Int. Cl.[3] G10H 1/02; H03F 3/26
U.S. Cl. 84—1.21 4 Claims



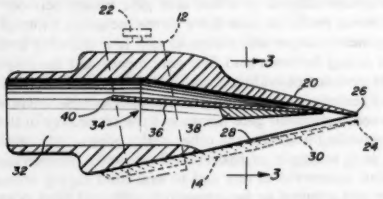
1. A music creating system comprising
an electrical musical instrument such as an electric guitar or the like for generating electrical music signals,
a speaker having an impedance, and
amplifier means connected between said instrument and speaker for amplifying said electrical music signals and cooperating with said speaker for sustaining sounds generated by said electrical musical instrument and for providing harmonics of such sounds at higher power, said amplifier means comprising
an input section for receiving electrical music signals generated by the instrument, and
output means adapted to be connected to said speaker for providing an impedance considerably greater than the impedance of said speaker, said output means comprising
a pair of power field effect transistors having output drain electrodes presenting an output impedance in the order of about twenty-five hundred ohms, and
output transformer means connected to said drain electrodes in push pull for providing said transistors with a drain to drain load of not more than about one hundred ohms, whereby said output means provides a high impedance constant current source to said speaker connected thereto.

4,345,503

INTERCHANGEABLE TONE CHAMBER

Clinton A. Runyon, 174 Emerite Dr., Lafayette, La. 70506

Filed Jun. 17, 1981, Ser. No. 274,661
Int. Cl.[3] G10D 9/02
U.S. Cl. 84—383 R 8 Claims



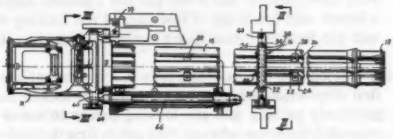
1. In a mouthpiece for a woodwind musical instrument wherein the mouthpiece comprises a hollow mouthpiece frame and a primary reed, the frame defining an interior tone chamber having an end for attachment to a length of tubular instrument body and having a chink opening between said primary reed and said mouthpiece for blowing of air therethrough to produce a musical tone, the improvement comprising a tone-altering member mounted within said tone chamber, said member comprising a secondary reed for vibrating sympathetically with said primary reed and a wedge mounted to said secondary reed, said secondary reed and said wedge modifying the tone produced.

4,345,504

GUN MOUNT

Robert G. Kirkpatrick, Shelburne, and Ronald R. Snyder, Georgia, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Apr. 8, 1980, Ser. No. 138,473
Int. Cl.[3] F41D 11/24
U.S. Cl. 89—37 GM 5 Claims



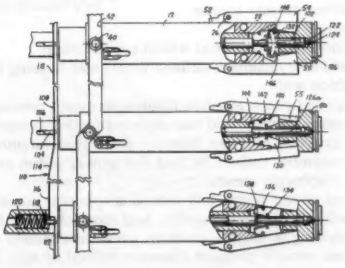
1. A gun comprising:
a housing;
a rotor having a plurality of gun barrels journaled for rotation about a longitudinal axis with respect to said housing;
clamp means secured to said plurality of gun barrels;
ring mass means having a longitudinal bore therein;
first antifriction bearing means journaling said clamp means for rotation with respect to said ring mass means about said longitudinal axis;
first stationary support means;
second antifriction bearing means journaling said ring mass means to said first stationary support means for displacement along said longitudinal axis of said first antifriction bearing means and said ring mass means with respect to said first stationary support means.

4,345,505

FIRING PIN LOCKING SYSTEM

Raymond A. Patenaude, Burlington; Steven R. Duke, Williston, and John K. Coolidge, Colchester, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Jun. 11, 1980, Ser. No. 158,197
Int. Cl.[3] F41D 11/06
U.S. Cl. 89—154 5 Claims



1. A gun having a longitudinal axis and comprising:
a receiver;
a chamber;

a gun bolt movable along a path in said receiver parallel to said axis to and between the aft disposition whereat said chamber is open and a forward disposition whereat said chamber is closed by said gun bolt;

said gun bolt having a bolt face and carrying a firing pin, and a control means;

said firing pin being movable along a path in said gun bolt to and between an aft disposition whereat the forward end of said pin is aft of said bolt face and a forward disposition whereat said forward end is forward of said bolt face;

said control means being movable along a path to and between an aft disposition and a forward disposition relative to said gun bolt;

gun bolt locking means carried by said receiver and movable by said control means to and between a first disposition whereat said gun bolt is locked to said receiver to fixedly close said chamber and a second disposition whereat said gun bolt is free of said bolt locking means;

firing pin locking means carried by said gun bolt and movable to and between a first disposition whereat it interferes with movement of said firing pin and a second disposition whereat said firing pin is free to said pin locking means, said pin locking means being normally biased to its first disposition;

said bolt locking means, if and only if, it is substantially in its first disposition whereat said gun bolt is locked thereby positively causing said pin locking means to move to its second disposition whereat said pin is free thereof.

4,345,506

VACUUM TYPE BOOSTER

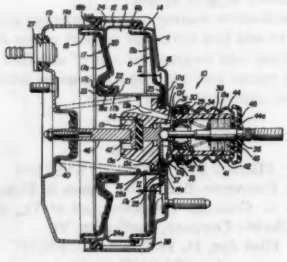
Atsushi Ohomi, Anjo, Japan, assignor to Aisin Seiki Company, Ltd., Kariya, Japan

Filed May 7, 1980, Ser. No. 147,590

Claims priority, application Japan, May 17, 1979, 54-61104

Int. Cl.³ F15B *9/10*; F01B *19/00*; F16J *3/02*

U.S. Cl. 91—376 R **3 Claims**



1. A vacuum type brake booster comprising:

a negative pressure source;

a housing;

a partition wall positioned within said housing;

front and rear chambers defined within said housing by said partition wall;

a first power piston and first diaphragm means positioned in said rear chamber, said rear chamber further comprising a first constant pressure chamber and a first variable pressure chamber defined by said first power piston and said first diaphragm means;

a second power piston and second diaphragm means positioned in said front chamber, said front chamber further comprising a second constant pressure chamber and a second variable pressure chamber defined by said second power piston and said second diaphragm means, said first and second power pistons being integrally connected with each other, said first and second constant pressure chambers communicating with each other and communicating with said negative pressure source and said first and second variable pressure chambers communicating with each other;

said first power piston including a hollow axial portion slidably and sealingly extending through a rear wall portion of said housing;

a valve mechanism disposed in said hollow axis portion of said first power piston for selectively connecting said first and second variable pressure chambers with said constant pressure chambers and atmospheric pressure; said first power piston including a plastic core portion including said hollow axial portion and a metallic disc portion, said metallic disc portion including a plurality of pawls formed therein extending forwardly from the inner peripheral portion of said disc portion and being bent inwardly at end portions thereof; said core portion including a flange portion at the outer periphery thereof; said flange portion of said core portion and an inner peripheral portion of said first diaphragm means being enclosed between said inner peripheral portion of said disc portion and said end portion of said pawls to thereby secure said core portion and said disc portion; said second power piston including a sleeve portion sealingly and slidably extending through said partition wall of said housing, said sleeve portion having a sufficient inner diameter for receiving said core portion of said first power piston; and

said sleeve portion including an inwardly bent portion at the rear end portion thereof between said flange portion and said inner peripheral portion of said disc portion interconnecting said first and second power pistons.

4,345,507

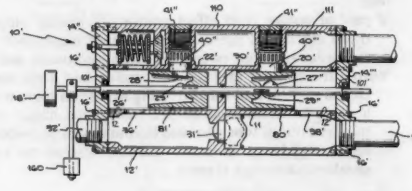
ELEVATOR FLUID FLOW CONTROL VALVE

Elmer J. Simpson, Margate, and Glen A. Rued, Pompano, both of Fla., assignors to Elevator Equipment Co., Los Angeles, Calif.

Filed Mar. 6, 1980, Ser. No. 127,767

Int. Cl.³ F15B *13/044*

U.S. Cl. 91—449 **6 Claims**



1. A hydraulic control valve system comprising: a body including a first chamber compartment with an inlet port and an outlet port and a second chamber compartment with an inlet port and an outlet port; first and second gate means rotatably mounted in said body for opening and closing respective outlet ports; drive means in operative engagement with the gate means adapted to rotate said gate means between open and closed positions, said drive means including external actuating means; wiper seal means in said first chamber compartment acting between said first gate means and the respective outlet port for providing a seal for the respective outlet port; wiper seal means in said second chamber compartment acting between the second gate means and the respective outlet port for providing a seal for the other outlet port; a hydraulic actuated jack, a supply of hydraulic fluid under pressure, a fluid conduit connected at one end to said fluid supply and at the other end adapted to be connected with said inlet ports and said jack, there being an intermediate one-way valve in said conduit having an open position allowing flow of fluid from said supply to said other end, said fluid conduit including by-pass means connected between a point upstream of said one-way valve and the inlet for said first chamber and between

a point downstream of said one-way valve and the inlet of said second chamber.

4,345,508

CONTROL SYSTEM FOR SEQUENTIALLY ACTUATING FLUID ACTUATORS

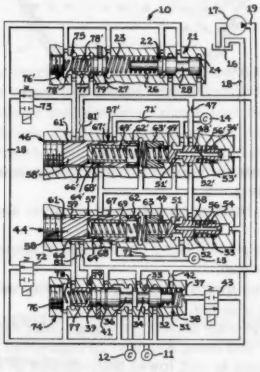
Alan R. Coutant, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00684, § 371 Date Jun. 2, 1980, § 102(e) Date Jun. 2, 1980, PCT Pub. No. WO81/03526, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 2, 1980, Ser. No. 230,969

Int. Cl.³ F15B *11/20*

U.S. Cl. 91—516 **8 Claims**



1. In a control system **(10)** adapted for sequentially actuating first **(11)**, second **(12)** and third **(13)** fluid actuators and having a tank **(16)**, a pump **(17)** and a drain line **(18)** connected to the tank **(16)**, a supply line **(19)** connected to the pump **(17)**, and a selector valve **(31)** connected to the supply line **(19)** and to the first **(11)** and second **(12)** fluid actuators and being movable between a first position at which the supply line **(19)** is communicated with the first fluid actuator **(11)** and a second position at which the supply line **(19)** is communicated with the second fluid actuator **(12)**, the improvement comprising:

a fluid actuated valve **(44)** connected to the supply line **(19)**, the drain line **(18)**, and the third fluid actuator **(13)** and having a valve element **(48)** movable between a first position at which the third fluid actuator **(13)** is communicated with the drain line **(18)** and a second position at which the supply line **(19)** is communicated with the third fluid actuator **(13)**, a spring **(56)** biasing the valve element **(48)** to the first position, and a fluid chamber **(61)** at one end of the valve element **(48)**, said valve element **(48)** being moved to the second position in response to fluid pressure in the fluid chamber **(61)** exceeding a preselected value and to the first position in response to the fluid pressure in the fluid chamber **(61)** dropping below the preselected value;

means **(74)** for dumping the fluid in the fluid chamber **(61)** of the fluid actuated valve **(44)** to the drain line **(18)** for dropping the fluid pressure in the fluid chamber **(61)** below the preselected value responsive to moving the selector valve **(31)** between the first and second positions; and

an orifice **(81)** connecting the supply line **(19)** to the fluid chamber **(61)** and being of a size sufficient for delaying the filling of the fluid chamber **(61)** with fluid until the selected one of the first and second fluid actuators **(11,12)** is filled with fluid.

4,345,509

CONTAMINANT TRAP FOR FLUID OPERATED ROTARY ACTUATOR

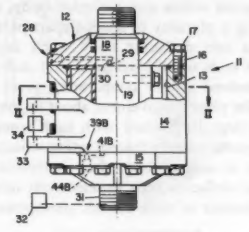
John W. Bridwell, Morton, and James R. Doyle, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00782, § 371 Date Jun. 23, 1980, § 102(e) Date Jun. 23, 1980, PCT Pub. No. WO82/00045, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 23, 1980, Ser. No. 245,233

Int. Cl.³ F15B *21/04*; F01C *9/00*

U.S. Cl. 92—78 **10 Claims**



1. In a rotary actuator **(11)** having housing means **(12)** for defining a vane chamber **(13)**, an actuator shaft **(18)** extending within the vane chamber **(13)** and being rotatable relative to the housing means **(12)**, a vane **(24)** extending radially from the actuator shaft **(18)** within the vane chamber **(13)**, and port means **(28)** for transmitting pressurized fluid to and from the vane chamber **(13)** through flow passages **(29, 30)** which open into said vane chamber **(13)** to pivot the vane **(24)** and turn the actuator shaft **(18)** relative to the housing means **(12)**, the improvement comprising:

trapping means **(39)** for retaining particulate contaminants of the fluid within the vane chamber **(13)** at a location **(38A)** which is away from the path of movement of the vane **(24)** and away from said flow passages **(29, 30)**, wherein said trapping means **(39)** includes at least a pair of spaced apart sump cavities **(41A, 41B)** formed within said housing means **(12)** and opening into said vane chamber **(13)**, a first **(41A)** of said sump cavities **(41A, 41B)** being adjacent one end of the path of travel of said vane **(24)** and the other **(41B)** of said sump cavities being adjacent the other end of the path of travel of said vane **(24)**.

4,345,510

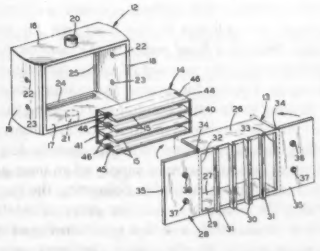
LOUVER ASSEMBLY

Robert A. Sterett, Jackson, Mich., assignor to LOF Plastics Inc., Detroit, Mich.

Filed Aug. 4, 1980, Ser. No. 175,035

Int. Cl.³ F24F *13/16*

U.S. Cl. 98—40 VM **6 Claims**



1. A louver assembly comprising a tubular housing having a generally rectangular interior passageway open at both ends

and defined by top, bottom and end walls, a deflector body mounted within said tubular housing, said deflector body including a U-shaped central section with top and bottom legs extending normally from an elongated planar portion, and a wing at each end of said planar portion initially coplanar therewith and joined thereto by a living hinge and folded inwardly about said hinge against the ends of said legs forming a box-like member providing an open passageway through said housing, each said wing including a protuberance on its outer surface adapted to snap fit into a corresponding aperture in the adjacent end wall of said tubular housing upon insertion of said deflector body therein with said wings folded, and a vane cartridge mounted within said deflector body, said vane cartridge including a plurality of spaced-apart parallel vanes extending across said deflector body, each said vane being mounted at its ends to said wings of said deflector body by pivot pins received within cooperating pivot seats on the folded wings for pivotal movement about its longitudinal axis, and tie bars integrally formed with said vanes at a pair of diagonally opposite corners thereof interconnecting said vanes for movement in unison about their individual longitudinal axes within said deflector body to selectively direct air emerging from said louver or close off said passageway.

4,345,511

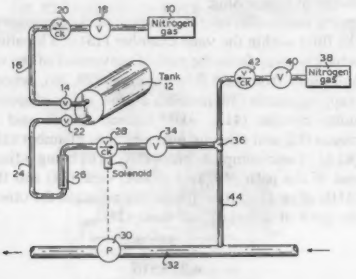
SULFUR DIOXIDE ADDITION FOR MUST

James W. Lunt, Fresno, Calif., assignor to Paul Masson, Inc., Saratoga, Calif.

Division of Ser. No. 184,145, Sep. 4, 1980, Pat. No. 4,302,476. This application Apr. 10, 1981, Ser. No. 252,908

Int. Cl.³ C12C 7/14

U.S. Cl. 99—276 **8 Claims**



1. A system for relatively quickly applying and evenly distributing substantially accurate amount of sulfur dioxide continuously to must being pumped through a conduit during a wine making procedure, comprising: a first conduit containing must that is being pumped therethrough, a cylinder containing sulfur dioxide, means for maintaining the sulfur dioxide in the cylinder under constant and uniform pressure, a conduit means extending from the cylinder to the must line for delivering sulfur dioxide thereto, a flow meter in the conduit means for accurately monitoring the amount of sulfur dioxide deliver to the must conduit, a valve for closing the conduit means when no must is flowing in the must conduit and opening the conduit means when must is flowing in the must conduit, control means for controlling the rate of flow of sulfur dioxide delivered to the must conduit, a first source of supply of an inert gas under pressure, and a second conduit for delivering the inert gas to the sulfur dioxide conduit means for entry with the sulfur dioxide into the must conduit so that upon closing of the sulfur dioxide conduit means by the valve, the inert gass will be adapted to prevent juice from the must from migrating back into the conduit means.

4,345,512

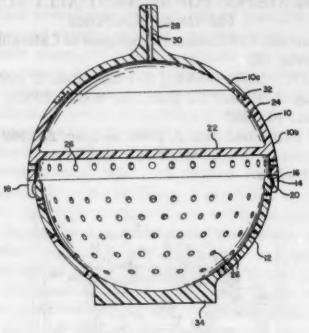
CONTAINER FOR MAKING A TEA BEVERAGE

Richard C. Moore, 2423 N. Humboldt, Portland, Oreg. 97217

Filed Oct. 24, 1980, Ser. No. 200,157

Int. Cl.³ A47J 31/18

U.S. Cl. 99—323 **3 Claims**



1. A container for mixing a tea beverage in a supporting vessel comprising

(a) a hollow body portion formed of upper and lower sections,

(b) said body portion being constructed of microwave transparent material,

(c) connecting means releasably connecting said upper and lower sections together,

(d) said lower body section having an outer surface of convex shape and being arranged to receive tea leaves,

(e) perforations in said lower body section of a size which confine tea leaves but which admit water for steeping the tea leaves and to discharge flavored water,

(f) said upper body section having a compartment defined by imperforate wall means comprising a bottom wall portion and upper enclosing top and side wall portions,

(g) said compartment providing buoyant support of the container whereby in making a tea beverage said container floats on the water to be flavored with at least a portion of said lower section below the surface for steeping the leaves and flavoring the water circulating through said container,

(h) and venting means in an upper portion of said upper section leading from said compartment to atmosphere to relieve expanding gases in said compartment.

4,345,513

ELECTRIC TOASTER

David Holt, Cambridge, England, assignor to Pifco Limited, Failsworth, England

Filed Feb. 17, 1981, Ser. No. 235,272

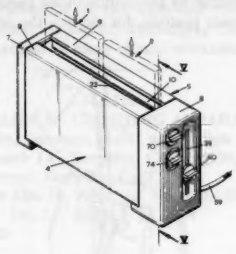
Claims priority, application United Kingdom, Feb. 23, 1980, 8006210

Int. Cl.³ A47J 37/08

U.S. Cl. 99—327 **13 Claims**

1. A toaster for toasting a slice of bread, comprising: a casing in which is located a reciprocable carriage movable towards and away from an aperture defined by said casing, through which aperture a slice of bread when mounted on said carriage can pass, a pair of enclosed electric bar heating elements disposed within said casing respectively adjacent opposed side edges of the casing which define said aperture, and a motor arrangement for driving said carriage from a first position located remote from said aperture towards said aperture into a second position at a predetermined speed, whereby a slice of bread mounted on said carriage can be made to pass between said elements to toast both sides of the slice progessively as the

slice passes out of said casing through said aperture, the degree of toasting being determined by the speed of movement of said carriage, the motor arrangement comprising a vertically oriented screw threaded rod, a motor for rotatably driving said screw threaded rod, a frame mounted on the rod and forming



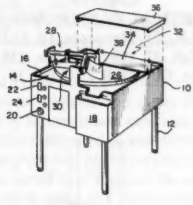
a part of the carriage, and brush means carried on the frame with bristles which contact the screw threaded surface of the rod, operation of said motor to rotate said rod causing said bristles to follow the screw thread of the rod to move the frame and thereby the carriage along the rod from the first position of the carriage into the second position.

4,345,514

CONTINUOUS HAMBURGER GRILL

Fred W. Morley, Indianapolis, Ind., assignor to David W. Morley, Indianapolis, Ind.

Filed Oct. 6, 1980, Ser. No. 194,382
Int. Cl.³ B30B *37/06*
U.S. Cl. 99—349 **12 Claims**



1. A continuous grill for hamburgers or the like, having means for forming unshaped balls or scoops or like quantums of ground meat into patties, comprising

a continuous moving, heated grill plate adapted to receive the meat quantums at a loading station and having a surface to which the meat will stick when pressed thereagainst,

a sloping pressure plate in a fixed position above said grill plate, beneath which the quantums pass as they are conveyed from the loading zone by the grill plate,

and a non-stick liner covering the meat-engaging surface of the pressure plate along which the meat will slide as it is carried thereunder by sticking engagement with the grill plate,

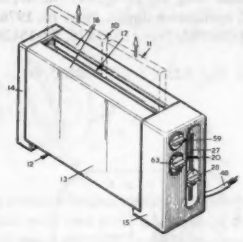
said pressure plate being sloped and positioned relative to the grill so as to press the meat quantums into sticking engagement with the grill plate and to compress them between itself and the grill plate into patties of substantially uniform thickness.

4,345,515

SLIDABLE BRUSH AND SCREW LINEAR DRIVE ARRANGEMENT

David Holt, Cambridge, England, assignor to Pifco Limited, Failsworth, England

Filed Feb. 17, 1981, Ser. No. 235,271
Claims priority, application United Kingdom, Feb. 23, 1980, 8006210; Mar. 6, 1980, 8007606
Int. Cl.³ A47J *37/08*
U.S. Cl. 99—393 **9 Claims**



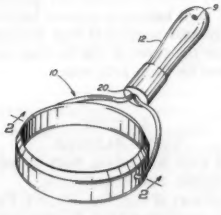
1. A linear drive arrangement comprising a screw threaded rod, a prime mover adapted to rotatably drive said screw threaded rod, a carriage mounted on the screw threaded rod, and a plurality of bristles which are carried by the carriage and which contact the screw threaded surface of the rod, operation of the prime mover to rotate the rod causing the bristles to follow the screw thread of the rod to drive the carriage along the rod, said bristles forming brush means and being sufficiently resilient so that the carriage can be slid over the rod by the application of force thereto, the bristles flexing to ride over the screw threaded surface of the rod.

4,345,516

COOKING AND CUTTING IMPLEMENT

Lawrence L. Sinclair, 123 Old Carriage Rd., Ponce Inlet, Fla. 32019

Filed Feb. 6, 1981, Ser. No. 232,140
Int. Cl.³ A47J *43/18*
U.S. Cl. 99—426 **9 Claims**



1. A kitchen implement comprising in combination:

a hollow cylindrical ring member open at each end and having a cutting edge on one end and a flat edge on the other end and a pair of openings located in the exterior side of said ring member;

a handle;

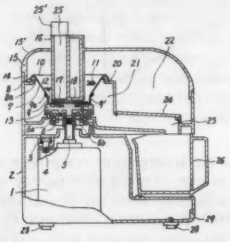
handle arm members connected to said handle and to the exterior of said ring member, said handle arm members engaging said pair of openings in said ring member, thereby allowing said arm members and handle to move relative to said ring and said arm members positioned to rest on one edge of said ring when said handle is not being held, whereby said ring member can cut a circular shape on one side with said cutting edge and can be placed on a

griddle on the flat edge for cooking an egg, or the like, therein.

4,345,517
JUICE EXTRACTOR

Yuzuru Arao, Takatsuki; Katsufumi Nishio, Toyonaka; Masashi Mikami, Osaka, and Toyoaki Murasawa, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 849,480, Nov. 7, 1977, abandoned. This application May 18, 1979, Ser. No. 40,735
Claims priority, application Japan, Nov. 16, 1976, 51-138159; Nov. 16, 1976, 51-154383; Nov. 16, 1976, 51-154384; Nov. 17, 1976, 51-138920
Int. Cl.[3] A23N *1/02;* **B04B** *5/00*
U.S. Cl. 99—511 **14 Claims**



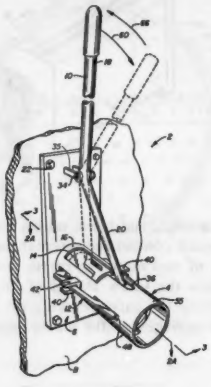
1. In a juice extractor including:
a rotatable centrifugal basket having a base, an axis of rotation and a filter portion in the shape of an inverted frustum of a cone, said filter portion having an open end of a selected diameter and a lower end of smaller diameter, said base having an inner face having cutting teeth thereon,
a food feeding duct extending vertically above said inner face with a selected gap between the bottom end of said feeding duct and said inner face of said base of said basket,
a motor for rotating said basket at high speed,
the improvement comprising:
said lower end of said filter portion of said basket being connected to said base of said basket and said base constituting a cylindrical-shaped pot part defined by a substantially vertical imperforate peripheral wall, said peripheral wall having a vertical height such that the top edge of said peripheral wall is located above and higher than the level of the bottom end of said food feeding duct by from 2–18 mm.

4,345,518
CAN CRUSHER

Jon B. Cash, and Paul K. Ludwig, both of San Bruno, Calif., assignors to Krushko, San Bruno, Calif.

Continuation-in-part of Ser. No. 124,151, Feb. 25, 1980, abandoned. This application Mar. 5, 1981, Ser. No. 240,717
Int. Cl.[3] B30B *9/32*
U.S. Cl. 100—98 R **6 Claims**

1. An improved can crusher comprising:
a piston;
a base;
tube means attached to and extending transversely from the base and within which said piston can move along a path from an upper position remote from the base to a lower position proximate the base, the tube means including means for receiving and positioning a can to be crushed so that one end thereof is proximate the base;
means for urging said piston along said path from the upper towards the lower position into engagement with the can to thereby crush the can by removing the other end of the can towards said one end thereof, said urging means including a handle having a handlegrip portion, a piston-engaging portion and a pivot point between said handlegrip and piston-engaging portions;
arm means connected with the tube means and movable into engagement with a side of the can, said arm means having a can piercing portion for denting and piercing the side;
means, activated by the motion of the piston from the upper to the lower position, for moving the arm means to dent

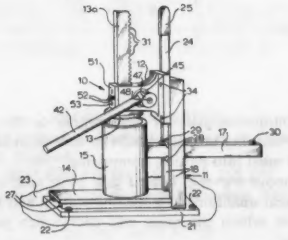


and pierce the can side before the piston moves the other can end toward the one can end to thereby facilitate the crushing of the can by the piston;
wherein the arm means moving means includes means connected with the piston for forcing said engaging means of said arm away from said path to thereby pivot said arm in a first direction and move said piercing means to pierce and dent the side of said can.

4,345,519
VERTICAL CAN CRUSHER

Mario C. Sabino, R.R. #1, Hennepin, Ill. 61327

Filed Feb. 27, 1981, Ser. No. 239,041
Int. Cl.[3] B30B *15/30, 9/32*
U.S. Cl. 100—215 **12 Claims**



1. In a vertical can crusher of the type having a vertical standard carrying a cantilever head supporting a vertically movable crushing ram, and means for vertically actuating the ram reciprocatably relative to an upwardly facing worktable substantially spaced below said head and fixed relative to the standard, the improvement comprising:
a vertical tubular can receptacle having its lower end separably supported on said worktable and having its upper end open to receive a can therein and adapted to receive said ram for crushing the can against said worktable;
and horizontal means attached to said receptacle and guided

by said standard for controlling said receptacle for movement relative to said standard and said head between:

a first position operatively aligned under said ram so that a can placed in said receptacle is adapted to be crushed into a flattened disk by operating said actuating means to drive the ram downwardly into the receptacle, followed by raising of the ram from said receptacle, and

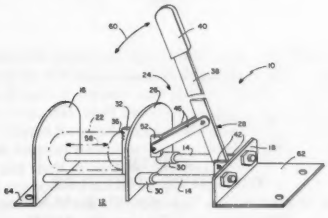
a second position adapted for discharging the crushed can from the receptacle clear of said worktable.

4,345,520

PORTABLE CAN CRUSHING APPARATUS

Norman Goldsmith, Saratoga, Calif., and Joseph W. Perrucci, 1135 Olive Branch La., San Jose, Calif. 95120, assignors to Joseph W. Perrucci, San Jose, Calif.

Filed Jan. 29, 1981, Ser. No. 229,649
Int. Cl.³ B30B *9/32, 1/04*
U.S. Cl. 100—293 **8 Claims**



1. A portable can crushing apparatus comprising:

(a) means including a pair of spaced-apart parallel rods and a front end plate normal to and connected with said rods at forwardmost ends of the latter for supporting a can to be crushed on and extending between said rods with one end of the can resting against said front end plate;

(b) a back end plate connected with and supporting rearwardmost ends of said rods;

(c) can crushing means including a crush plate mounted for slidable movement along said rods in confronting relationship with said front end plate and handle means located between said crush plate and back end plate for moving said crush plate towards and away from said front end plate, whereby to crush said can; and

(d) a holding plate connected to and extending rearwardly of said back end plate in a plane parallel with and below said rods so as to serve as a footrest for maintaining the end plates and rods in place as a can is crushed on a horizontal support surface.

4,345,521

INHIBITING MEANS FOR POSTAGE REGISTER PARCEL IDENTIFICATION SYSTEM

John H. Soderberg, Monroe, N.Y., and Leonard M. Penque, Huntington, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 14, 1981, Ser. No. 224,976
Int. Cl.³ B41J *1/22*
U.S. Cl. 101—93 **15 Claims**

1. A value printing apparatus comprising:

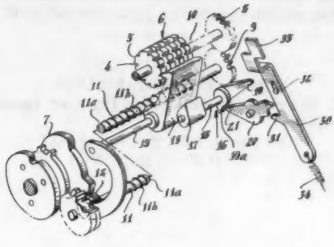
a printing head;

at least one print wheel having raised characters to be printed and recessed spaces between the print characters, said print wheel being mounted within said printing head and protruding at least partially from the surface of the head;

means for automatically incrementally advancing said print wheel one unit during the printing cycle;

inhibiting means for selectively preventing the incremental advancement of said print wheel said one unit during the printing cycle, said inhibiting means comprising:

an edged member adjacent to and engageable with said print wheel having a first edge adapted to fit the recessed spaces between the print character of the print wheel;



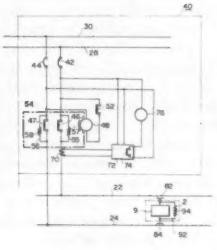
activation means adjacent said edged member for retaining it in contact with said print wheel, such that said first edge is locked into a recessed space between two print characters on said print wheel.

4,345,522

AERIAL TRANSPORT SYSTEM

Keiichi Miyamoto; Naohiko Inoue, both of Yokohama, and Yasuhisa Takeuchi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 8, 1980, Ser. No. 110,333
Claims priority, application Japan, Feb. 11, 1979, 54-14598; Feb. 20, 1979, 54-17834
Int. Cl.³ B61B *3/02;* **B60L** *15/22*
U.S. Cl. 104—89 **39 Claims**



16. In an aerial transport system having an aerial track having therealong a pair of power supply cables, a pair of electric current-carrying cables in parallel relationship with respect to one another and with respect to the track and being separated at longitudinal regular intervals so as to define respectively independent electric power supply zones, self-propelled vehicles, each having an electric current collecting means to collect electric power from the current-carrying cables and to supply the power to an electric driving means mounted on the vehicle so as to drive wheels engaging the track for propelling the vehicle along the track, said transport system including an electric power supply control means for controlling driving of the vehicle, said electric power control means comprising:

a first circuit for each power supply zone interposed between the power supply cables and the current-carrying cables for comprising a power supply circuit therewith;

a second circuit provided in said vehicle, which second circuit completes the power supply circuit while the vehicle travels in the power supply zone;

a means for detecting an intensity of electric current which flows through said power supply circuit in said power

supply zone so as to detect the existence of a vehicle in said zone; and

a third circuit associated with said first circuit and a corresponding detecting means in an adjacent forward power supply zone, said third circuit serving to block the electric current flow in said power supply circuit when said detecting means in said adjacent forward zone detects the electric current exceeding a predetermined level.

4,345,523

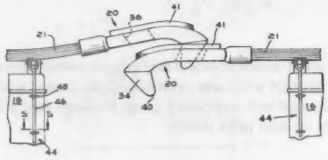
RAILWAY CAR STABILIZER

David H. Robertson, 35 Mill Brook Dr., East Longmeadow, Mass. 01028

Filed Jun. 9, 1980, Ser. No. 157,667

Int. Cl.³ B61D *49/00;* **B61G** *3/00, 5/02*

U.S. Cl. 105—1 A **6 Claims**



1. Apparatus for stabilizing a string of coupled railway cars during movement of the cars over railway tracks, said apparatus comprising:

(a) a plurality of flexible cables overlying an upper surface of said cars, each cable traversing substantially the entire length of a respective one of said cars and overhanging at least one end of said one car, said cable being secured to the upper surface of said cars by a gripping means which fixedly holds a section of the cable in a stationary position;

(b) each cable having two end portions which extend from opposite sides of the gripping means with at least one of the end portions having a coupling member attached thereto, adjacent ones of said coupling members being engaged to connect adjacent cars, whereby rolling motion of one of said adjacent connected cars about the car's longitudinal axis causes one of the end portions of the cable secured to said car to twist about said axis, while the gripping means for said cable prevents the cabble's other end portion from twisting, whereby said twisted cable portion absorbs torsional forces imparted to it by said car and said twisted cable portion and said gripping means inhibit the transmission of said torsional forces to another of the adjacent connected cars.

4,345,524

LOAD CARRYING VEHICLE AND TRACK THEREFOR

Weston R. Loomer, Walton, Ky., assignor to Litton Systems, Inc., Florence, Ky.

Filed Feb. 26, 1980, Ser. No. 124,773

Int. Cl.³ B62D *21/00;* **B60P** *1/00;* **B61F** *1/00*

U.S. Cl. 105—404 **7 Claims**

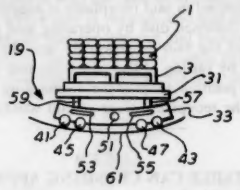
1. A load carrying vehicle adapted to ride on a track which deflects longitudinally under load comprising:

a frame;

a load carrying platform having first and second longitudinally spaced ends and first and second transversely spaced sides coupled to said frame;

first and second side plates, one located adjacent to each of said first and second sides of said platform and oriented generally perpendicularly thereto, coupled to said frame; and

at least four wheels coupled to said frame adjacent to each of said side plates, the first and second of said four wheels being exterior wheels and being positioned adjacent to the first and second ends of said platform and the third and fourth of said wheels being interior wheels, said interior wheels being located longitudinally inward of said first and second wheels, respectively,



wherein said first and second vehicle side plates are structured to longitudinally bend under load, whereby a load on said vehicle is supported by said third and fourth wheels as well as by said first and second wheels.

4,345,525

FURNITURE STRUCTURE

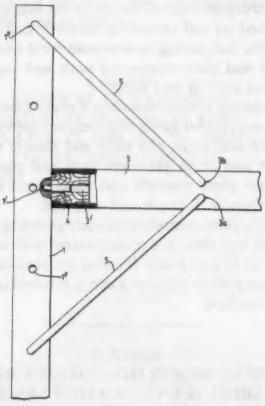
Christian de poorter, Via Canonica, 91, 20154 Milano, Italy

Filed May 29, 1979, Ser. No. 43,037

Claims priority, application Japan, May 26, 1978, 21959B/78

Int. Cl.³ A47B *9/14, 47/00*

U.S. Cl. 108—107 **4 Claims**



1. A furniture structure comprising at least two vertical framing pieces, at least one horizontal framing piece, each said vertical framing piece defining two opposed sides with spaced holes in each side and a third side perpendicular to said two sides, at least one hole in said third side perpendicular to said spaced holes, said horizontal framing piece defining two opposed sides with spaced holes in each side and at least two holes in said horizontal framing piece each aligned with one hole in said third side of a vertical framing piece when assembled, a pin fitting within said hole of said third side of said vertical framing piece and the aligned hole of said horizontal framing piece and rigid rods positioned at about 45° with respect to the vertical and horizontal framing pieces and fitting within holes in the sides of said vertical and horizontal framing pieces.

4,345,526

SHELVING DISPLAY AND SUPPORT

Kenneth F. Streit, Mt. Prospect, Ill., assignor to Techplastics, Inc., West Chicago, Ill.

Filed Dec. 7, 1979, Ser. No. 101,095
Int. Cl.[3] A47B 47/00
U.S. Cl. 108—111 11 Claims

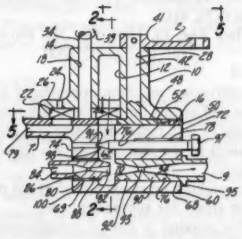
1. A stand for packaged goods, beverages and the like, comprising: a pole; a base having a passage adapted to receive said pole therein and to support said pole in vertical orientation; at least one shelf, said shelf having a passage adapted to receive said pole therein for positioning said shelf in a horizontal disposition; and support means between said base and said shelf for holding said shelf in spaced relationship with respect to said base, said support means including first and second wing pairs, each wing of each pair including a top edge adapted to bear against said shelf, a bottom edge adapted to bear against said base, and a side edge common to the wings of each pair and disposed perpendicularly to the top and bottom edges of each wing, each wing pair further including first and second spaced hooks formed integrally with its wings at the side edge thereof, the hooks of the first wing pair being internested with the hooks of the second wing pair and said internested hooks collectively defining a passage for receiving said pole therein, whereby when said pole is received in the passages in said base, shelf and hooks, said wings bear against said base and said shelf to support said shelf in spaced relationship with respect to said base.

4,345,527

SOLID FUEL PARTICLE AND AIR FUEL CONTROL DEVICE

William C. Marchand, 11339 Roxbury, Detroit, Mich. 48224

Filed Jul. 14, 1980, Ser. No. 168,072
Int. Cl.[3] F23K 3/02
U.S. Cl. 110—104 R 21 Claims



1. A solid fuel particle metering device for mixing solid fuel particles with air from a high pressure air source to form a uniform combustible mixture for burning in a combustion system, said device comprising:

a first housing having an inlet end, an opposite end and portions defining a fuel inlet passage, said fuel inlet passage extending from said inlet end through said opposite end, said fuel inlet passage further adapted to receive said solid fuel particles therein;

a second housing mounted adjacent to said first housing, said second housing having an inlet end neighboring the opposite end of the first housing; an opposite end distal said opposite end of the first housing; one side extending from said inlet end to said opposite end; an opposite side opposite to said one side and a body portion defining a blind cavity extending from said inlet end toward said opposite end, said housing body portion further having a first aperture extending from said one side through said opposite side and intersecting said blind cavity for flow communication between said blind cavity and said first aperture;

means for metering and transferring said solid fuel particles from said fuel inlet passage in said first housing to said blind cavity of said second housing, said metering and transferring means being mounted in said first housing;

means for injecting air from said air source into said blind cavity, said injecting means being mounted in said first aperture so as to mix air with the solid fuel particles in said blind cavity of the second housing to form said uniform combustible mixture; and

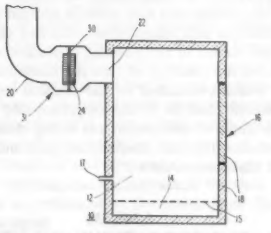
means for ejecting said uniform combustible mixture from said blind cavity, said ejecting means being mounted in said first aperture in said second housing so as to eject said uniform mixture from said solid fuel particle metering device; said first housing further comprising a first passage adjacent but spaced away from said fuel inlet passage; a counterbore in said opposite end of the first housing and coaxially located with said first passage; a second air inlet passage means interposed said fuel inlet passage and said means for injecting air such so that the air entering said blind cavity through said injecting means causes air to flow through said second air inlet passage means from the outside of the solid fuel particle metering device into said second air inlet passage means to said blind cavity.

4,345,528

WOOD BURNING STOVE

Roger A. Allaire, Big Flats, and Robert V. VanDewoestine, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 28, 1980, Ser. No. 173,156
Int. Cl.[3] F23J 15/00
U.S. Cl. 110—203 6 Claims



1. A wood burning stove comprising:

a combustion chamber with an access door;

a flue in communication with said combustion chamber for removing exhaust therefrom;

a catalytic converter means for removing oxidizable species from said exhaust, said catalytic converter means having a honeycomb structure having a plurality of catalytically active passageways extending therethrough and being rotatably mounted in and transversely across said flue whereby impedance to said exhaust caused by said converter means may be selectively maximized when the longitudinal axes of said passageways are parallel to the

longitudinal axis of the flue and minimized when the longitudinal axes of said passageways are perpendicular to the longitudinal axis of said flue; and

means for moving said converter means between positions of said converter means substantially extending transversely across said flue and of said converter means insubstantially extending across said flue, said means for moving said converter means comprising axial means extending transverse of said flue and on which said converter means is mounted for rotation between positions of said converter means substantially extending transversely across said flue with said passageways parallel to the longitudinal axis of the flue and of said converter means insubstantially extending transversely across said flue with said passageways perpendicular to the longitudinal axis of said flue.

4,345,529

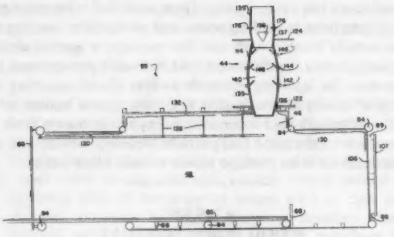
POLLUTION REDUCTION SMOKELESS AUTO INCINERATOR

Roy Weber, P.O. Box 336, and Bruce C. Huddleston, 865 N. Kalaheo Ave., both of Kailua, Oahu, Hi. 96734

Division of Ser. No. 906,814, May 17, 1978, Pat. No. 4,181,081, which is a continuation of Ser. No. 726,529, Sep. 27, 1976, abandoned. This application Aug. 13, 1979, Ser. No. 65,800

Int. Cl.³ F23B *5/00;* **F23C** *9/00;* **F23G** *7/06*

U.S. Cl. 110—213 **17 Claims**



1. Pollution control apparatus comprising

a conduit having an inlet for receiving pollutants and an outlet for expelling relatively pollution free exhaust,

body means positioned on the conduit forming a recirculation vortex combustion zone in the conduit immediately downstream of the body means, an annular space between said body means and said conduit providing communication between said combustion zone and said inlet, an air injection means in the conduit downstream of the body means for introducing air into the combustion zone, and

heating means connected to the conduit upstream of the combustion zone for introducing heat into the conduit to heat pollutants, said pollutants being directed past said body means into said combustion zone and being burned in said combustion zone.

4,345,530

INSTALLATION FOR BURNING-OUT SCRAP METAL

Peter-Michel Gutschmidt, Tegernsee, Fed. Rep. of Germany, assignor to Orgatechna Treuhand AG, Ennetbuergen, Switzerland

Filed Feb. 6, 1980, Ser. No. 119,175

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904479

Int. Cl.³ F23G *7/00*

U.S. Cl. 110—215 **8 Claims**

1. An installation for burning-out scrap metal goods for the purpose of reclaiming scrap metal, comprising:

(a) at least one furnace wagon, which is capable of being loaded with the scrap metal goods to be burned-out;

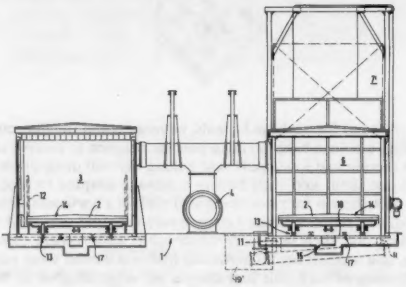
(b) at least one burning-out chamber into which said furnace wagon is movable for burning-out the scrap metal goods to produce scrap steel;

(c) means for heating said burning-out chamber to a temperature of at least about 600° C.;

(d) at least one afterburning chamber communicating with said burning-out chamber for afterburning flue gases produced in the burning-out chamber at a temperature from about 1100° to 1200° C.;

(e) a waste gas purifying plant communicating with said afterburning chamber for eliminating the flue gas impurities and for the scrubbing of the flue gases originating from the afterburning chamber;

(f) at least one cooling chamber arranged adjacent to and in selective communication with said burning-out chamber for cooling the burned-out material, said cooling chamber



being connected at the charging end of each burning-out chamber;

(g) each of said burning-out chambers including a door which is arranged at the charging end and which seals so as to be impervious to smoke;

(h) each of said heating means in each of said burning-out chambers comprising a plurality of selectively operable burners positioned along the length of said burning-out chamber;

(i) a plurality of rails for driving said furnace wagons into the burning-out and cooling chambers; and

(j) said furnace wagon having a floor, said floor having a slope leading from the center to both longitudinal sides, along which sides gullies are provided for catching melting metal.

4,345,531

APPARATUS AND METHOD FOR CULTIVATING LAND

Narciss A. Redl, 730 Spadina, Apt. 1403, Saskatoon, Saskatchewan, Canada (S7K 4H7)

Filed Apr. 15, 1980, Ser. No. 140,674

Int. Cl.³ A01C *7/00*

U.S. Cl. 111—1 **1 Claim**

1. A land cultivating machine comprising a mobile chassis having a frame and means on the frame for removing a predetermined amount of soil, cultivating said soil and replacing said soil in the ground as the machine moves forwardly, said machine comprising;

(a) means for picking up straw ahead of the machine and for cutting the straw for subsequent use;

(b) means for making a cut of predetermined depth and width in the soil to remove crusted or dried soil and to move that soil onto each side of the path to be treated;

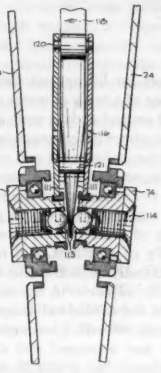
(c) a disc-supporting suspension arm supported by said frame in a trailing arrangement and in alignment with the path of travel of the machine;

(d) resilient means for biasing said suspension arm towards the ground surface;

(e) first and second discs respectively mounted on said suspension arm by first and second axles on either side of a

disc spreading guide disposed therebetween, said spreading guide having downwardly tapering surfaces on the lower end thereof and said axles having bearing means for cooperating with said tapering surfaces such that said discs are maintained by said guide in spaced relation with the lower ends thereof inclined toward one another when said discs are disposed in an operating position, and said lower ends of said discs are spread apart if said discs move upwardly in response to ground obstructions;

(f) a stripping bar engaging the inner surfaces of said discs during rotation thereof;



(g) shoe means for guiding soil cut from the ground by said discs into the confines of the machine;

(h) a rotative tilling device mounted rearwardly of said discs in the path of soil being directed into the machine for breaking up the soil and subsequently directing the soil into a mixing chamber rearwardly positioned relative to said tilling device;

(i) means in said mixing chamber for crushing rocks therein, mixing additives with the soil and directing said soil in packing density into the trench cut by said discs; and

(j) means for applying seed onto the top of the trench and applying straw onto the top of the seed.

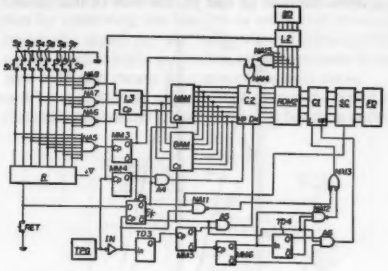
4,345,532

ELECTRONIC SEWING MACHINE WITH BACK STITCHING SYSTEM

Yasukata Eguchi, Kunitachi, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 486, Jan. 2, 1979, Pat. No. 4,236,468, which is a continuation of Ser. No. 863,143, Dec. 21, 1977, abandoned. This application Mar. 24, 1980, Ser. No. 133,132
Claims priority, application Japan, Dec. 27, 1976, 51/156462
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **1 Claim**

1. In a sewing machine, an arrangement for forming patterns made up of stitches, comprising, in combination, a static memory having a plurality of outputs and a plurality of address signal inputs and comprised of a plurality of storage units connected to said inputs and outputs and addressable by address signals applied to the address signal inputs of the memory; stitch-forming means provided with a plurality of stitch control signal inputs connected to the outputs of the memory and operative for producing any of a plurality of different stitches in dependence upon the signals produced at the outputs of the memory; addressing means including an addressing counter operative when activated for applying the address signals to the address inputs of the static memory to read out stitch control signals from the memory; synchronizing means operative for activating the addressing means in synchronism with the operation of the stitch forming means; and back stitching means manually operated to change the address signals in accordance with the required back stitches, said back stitching means including a manually operated switch, an address memory operative, when the manually operated switch is operated, to cause the addressing counter to count down the storage



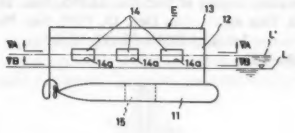
units of the static memory by the address signals, and signal inverting means connected between the static memory and the stitch-forming means to invert the stitch control signals read out from the static memory.

4,345,533

SEMI-SUBMERGED SHIP

Yoshikuni Kunitake, Nagareyama, Japan, assignor to Mitsui Engineering and Shipbuilding Co. Ltd., Tokyo, Japan

Filed Dec. 3, 1979, Ser. No. 99,934
Claims priority, application Japan, Feb. 20, 1979, 54-19560
Int. Cl.³ B63B *1/10, 1/32*
U.S. Cl. 114—61 **17 Claims**



1. A semi-submerged ship comprising at least two lower hulls always positioned below the surface of water and arranged substantially in parallel to each other with respect to the direction of advance, struts mounted substantially vertically on the upper portion of each of the at least two of lower hulls along substantially the entire length thereof and an upper hull supported by said struts and always positioned above the surface of water, wherein each strut is continuous in the lengthwise direction of the lower hull and at least one opening is formed on each strut wherein the height of said opening is less than the height of said strut and a water-tight seal is formed between the opening and the interior of the strut, and wherein the draft line is positioned on the openings of the struts while the ship is stopped.

4,345,534

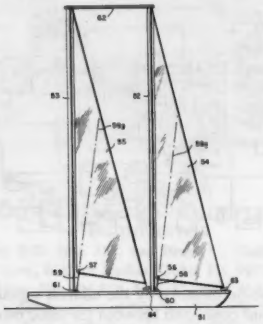
SAIL RIGGING SYSTEM

Richard E. Carter, Nahant, Mass., assignor to Carter Offshore Design, Inc., Nahant, Mass.

Filed Oct. 15, 1979, Ser. No. 84,546
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—106 **9 Claims**

1. A sail system, comprising a vessel having a plurality of masts and jibs, means for attaching each jib to each mast and supporting at least an upper part of said jib, means associated with each mast for attaching the tack of a jib to the vessel as a point directly forward of the mast, and fairlead means associ-

ated with each mast for attaching the clew of a jib to the vessel at a point such that, when the upper part is supported by the mast and the tack is attached to the vessel, at least one of said jibs, when closehauled, has a camber of about 12% to 25%, as measured horizontally at the clew of that jib and the angle of trim between the clew of that jib, the tack of that jib and the



centerline of the vessel is from about 10% to 16%, and wherein the lead position line defined by the fairlead means and the clew intersects the luff of the jib at a point between about 65 and 80% of the length of the luff, measured from the tack, and wherein at least one of said jibs is attached to roller furling means for reducing the exposed area of that jib.

4,345,535

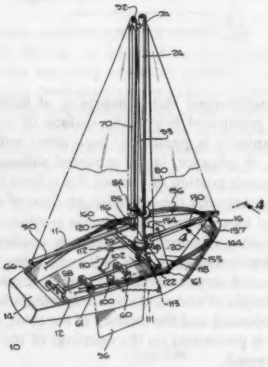
SAILBOAT TRIMMING AND STABILIZING SYSTEM

Abraham D. Ross, 534 Mary Ann Dr., Redondo Beach, Calif. 90278

Continuation-in-part of Ser. No. 12,755, Feb. 16, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,376

Int. Cl.³ B63B *39/00, 43/02*

U.S. Cl. 114—122 **12 Claims**



1. In a sailboat having a hull and a mainsail means for maintaining leveling or trimming of the hull comprising in combination, a mast mounted to be capable of tilting to port or starboard under the influence of the wind, means operatively connected to the mast to apply a force resisting the tilting of the mast, said means including a torsion bar mounted along the center line of the hull and connected to the mast whereby tilting of the mast applies torsion to one end of the bar about the axis of the torsion bar providing a righting moment and restoring force, the torsion bar having an end part connected to the boat whereby the torsion in the bar exerts a righting moment on the hull.

4,345,536

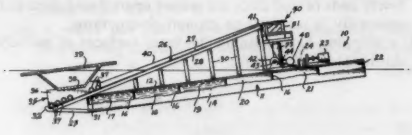
VESSEL RAISING HEAVY STRUCTURES

F. Brown Gregg, P.O. Box 1046, Leesburg, Fla. 32748

Filed Oct. 30, 1979, Ser. No. 89,663

Int. Cl.³ B63B *39/02*

U.S. Cl. 114—124 **13 Claims**



4. A marine vessel for lifting and elevating heavy objects relative to the surface of a body of water comprising a buoyant hull having first and second ends, a main deck, said hull having a plurality of compartments for receiving ballast, means for selectively introducing ballast into and removing ballast from said compartments to selectively raise and lower said first end of said hull relative to the surface of the body of water so as to lower a portion of said main deck to a point adjacent to the surface of the body of water, track means mounted so as to extend longitudinally of said hull, said track means having a first end dispose generally adjacent said main deck so as to be be disposed generally adjacent to the surface of the body of water when said first end of said hull is lowered thereby lowering said portion of said main deck with respect to the surface of the body of water and a second end disposed in a remote vertically spaced relationship to and above said main deck and vertically spaced above the surface of the body of water, support means mounting said track means on an incline with said first end of said track means being located generally adjacent said first end of said hull and said second end of said track means being remotely spaced longitudinally from said first end toward said second end of said hull, carriage means movably mounted on said track means, said carriage means having engaging means for cooperatively supporting the heavy objects, and means for moving said carriage means along said track means to raise or lower said carriage means with respect to said main deck and the surface of the body of water.

4,345,537

APPARATUS FOR RESTRAINING AND BERTHING A FLOATING BODY

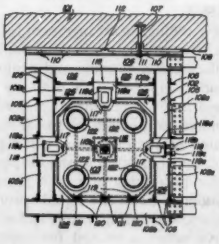
Shigeo Ueda, and Yuji Fukuda, both of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 970,096, Dec. 15, 1978, abandoned. This application Oct. 20, 1980, Ser. No. 198,397

Claims priority, application Japan, Dec. 26, 1977, 52-156952; Jan. 14, 1978, 53-3099

Int. Cl.³ B63B *59/02*

U.S. Cl. 114—219 **3 Claims**



1. An apparatus for restraining a floating body at a quay wall comprising; a bumper, a hydraulic piston and cylinder assembly having a movable member coupled to said bumper to

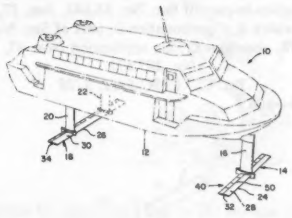
adjust the distance between said bumper and said quay wall and, distance pieces selectively interposed between said movable member and said quay wall for permanently maintaining said distance constant and independent of hydraulic pressure in said hydraulic piston and cylinder assembly, wherein at least two walls of said quay wall are connected to a cylindrical frame structure as guide means extending away from the quay wall for said movable member, said cylindrical frame structure having a cylindrical space within which is axially slidably arranged a core structure constructed as said movable member which is connected by said hydraulic piston and cylinder assembly to said quay wall, each of at least the upper and both side surfaces of said core structure is formed with an axially extending groove which engages a respective load support means connected to the frame structure and extending along the grooves of the core structure, sidewalls of said grooves and an end of said respective load support means are inclined at the same angle and a clearance is provided between a bottom of said grooves and the end of said respective load support means and, said cylindrical frame structure comprising a plurality of beams extending vertically and horizontally to form a rectangular cylinder within which is loosely fitted said core structure of a box-shaped structure.

4,345,538

FLAP FLEXURE RETAINER/SEAL FOR HYDROFOIL VESSELS AND THE LIKE

Gary J. Warner, Issaquah, and Winfried M. Feifel, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 31, 1980, Ser. No. 174,268
Int. Cl.³ B63B *1/24, 1/26*
U.S. Cl. 114—274 **20 Claims**



1. In a fluid foil having a plurality of trailing control flaps, or the like, hingedly engaged to the foil for rotation with respect thereto,

at least one of said flaps being a driving flap and at least one of said flaps being a driven flap,

a key extending from said driving flap into a keyway in said driven flap so that said flaps rotate together with respect to said foil,

an elastic liner being fitted into said keyway and being fitted on said key to protect surfaces of the key and keyway,

the improvement comprising:

retainer means between said driving and driven flaps in association with said key and keyway to secure said liner in said association with said key and keyway.

4,345,539

WARNING SYSTEM WITH PNEUMATIC FUNCTION GENERATOR

Henry L. Williams, Oklahoma City, Okla., assignor to Geosource Inc., Houston, Tex.

Filed Apr. 21, 1980, Ser. No. 141,770
Int. Cl.³ B66B *3/02*
U.S. Cl. 116—68 **12 Claims**

1. A pneumatic warning system for a boom-type load lifting device comprising:

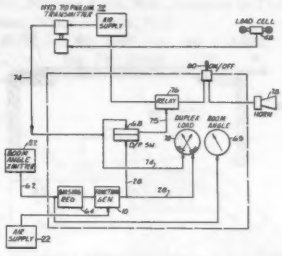
a pneumatic function generator including:

an air cylinder with means for receiving and storing an input pneumatic signal;

means for mechanically representing a predetermined curve, functionally dependent on said input pneumatic signal, mechanically connected to said air cylinder; and

means for translating the function of said curve to an output pneumatic signal for any value of said input pneumatic signal, mechanically connected to and operatively associated with said means for representing said curve;

means for transmitting a boom angle pneumatic signal, pneumatically connected to said pneumatic function generator;



means for determining the weight of a load on said lifting device;

means for delivering a pneumatic load signal to said pneumatic function generator,

comparator signal means for comparing said output signal of said pneumatic function generator with said pneumatic load signal, whereby said comparator means delivers a pneumatic output warning signal when said load signal exceeds said pneumatic function generator output signal; and

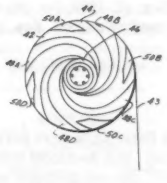
warning signal means connected to said comparator signal means for sounding a warning when said load signal exceeds said pneumatic function generator output signal.

4,345,540

TAPE CASSETTE

Irving Karmin, 32-22 92 St., Queens, N.Y. 11369

Continuation of Ser. No. 689, Jan. 3, 1979, abandoned. This application Oct. 24, 1980, Ser. No. 200,521
Int. Cl.³ G09F *9/00;* **G11B** *23/42*
U.S. Cl. 116—278 **6 Claims**



1. An improved tape cartridge, comprising:

a generally rectangular housing, viewing means, rotatable hub means mounted within said housing and recordable tape wound on said hub means to form a tape reel face consisting of a plurality of contiguous tape edges;

marking means applied to said plurality of contiguous tape edges before a first unwinding of said recordable tape, said marking means forming;

a first pattern, marked on said tape edges, each pattern of said marking means spaced substantially 90° apart on subsequent rewinding forms;

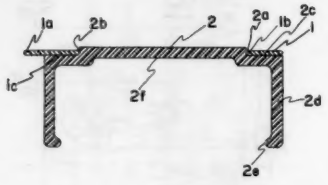
a second pattern, said first and second pattern causing alternating portions of said marking means and said tape to appear whereby rotational movement of said marking means indicated movement of said tape as seen by viewing means.

4,345,541

MONO-RINGED ROTATORY MEDICATION REMINDER

Antony-Euclid C. Villa-Real, Las Vegas, Nev., assignor to Medi-Timer Corporation, Las Vegas, Nev.

Filed Feb. 12, 1980, Ser. No. 120,871
Int. Cl.³ B65D *5/72*; G09F *9/00*
U.S. Cl. 116—308 **4 Claims**



1. A medication dosage time-intake reminder device for a container cap comprising:

a stationary central member having an annular ridge and groove in the top surface thereof and a downwardly depending annular wall, said top surface having time interval indicia thereon;

an outer annular ring member having an annular ridge portion for engagement with said ridge and groove portion in said top surface of said stationary central member whereby said annular ring member may be rotated relative to said top surface;

medication dosage indicating means on the surface of said outer annular ring member whereby upon rotation of said outer annular ring member with respect to said stationary central member, the medication dosage indicating means may be aligned with the time interval indicia to indicate the time of the next dose administration; and;

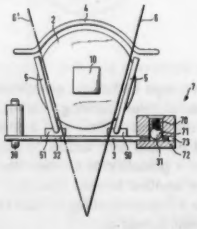
an annular protuberance on said depending annular wall whereby said protuberance may engage a portion of a container cap and the device can be rigidly retained on said container cap.

4,345,542

APPARATUS FOR PARAFFINING YARN

Friedrich Hauner, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,495
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 7927734[U]
Int. Cl.³ B05C *1/06*
U.S. Cl. 118—78 **4 Claims**



1. An apparatus for paraffining yarn with paraffin wax supplied by a rotationally mounted paraffin body as said thread travels along a path, a thread guide rail positioned before and after said paraffin body in the direction of travel of said thread, said paraffin body being displaceable in the direction perpendicular to a plane extending through said guide rails, and a stop against which said paraffin body bears limiting the displacement of said paraffin body, comprising:

said guide rails (3, 4) supporting the thread on their side opposite the paraffin body;

means (30) for pivotally supporting at least one of said guide rails (3) for pivotal movement transversely relative to the path of travel of said yarn from a first position in which the yarn travelling along said path occupies a position further away from said body in front of said paraffin body to a second position thereby entraining said yarn to occupy a position outside the axial movement path of said paraffin body when being withdrawn from its working position;

means for supporting said stop on said one of said guide rails (3);

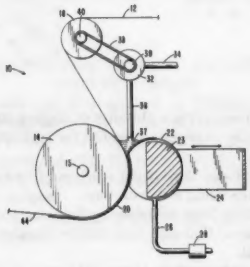
releasable lock means (7) for holding said one of said guide rails (3) in said first position wherein said stop bears against said paraffin body and for releasing said one of said guide rails (3) allowing said one of said guide rails to be pivoted to said second position wherein said stop (5) releases said paraffin body and said yarn being moved out of the path of said paraffin body thereby allowing said paraffin body to be removed without interferring with the travel of said thread.

4,345,543

APPARATUS FOR FORMING A COATING ON A SUBSTRATE

David J. Pipkin, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 53,143, Jun. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 882,281, Feb. 23, 1978, abandoned. This application Nov. 17, 1980, Ser. No. 207,571
Int. Cl.³ C05C *3/12, 3/18*
U.S. Cl. 118—106 **18 Claims**



1. Apparatus for coating a moving web with a coating liquid, the apparatus comprising:

backing support means adapted to engage one surface of the moving web so as to guide the web in a fixed-position path of travel;

at least one length of stationary smoothing film mounted so as to facilitate the positioning of a portion thereof adjacent the opposite surface of the web;

means to meter a coating liquid through at least one orifice which is positioned adjacent the confluence of the smoothing film and web;

pliant pressure generating means positioned to bear against said film in a manner to position said film adjacent the web and to provide both a static force and a high-hydrodynamic-pressure coating zone between the web and said film, compliance of said pressure generating means to said

backing support providing a coating zone whose length, in the direction of web movement, applies said hydrodynamic pressure to the liquid for at least a critical time interval which is sufficient to insure uniform coating thickness to the length of the web;

means to adjust the relative position of said pressure generating means and said support means, in order to control the length of compliance of said pressure generating means to said backing support, to thereby control said critical time interval; and

means to adjust the force with which said pressure generating means bears against said film, to thereby control the magnitude of said static force and high-hydrodynamic-pressure;

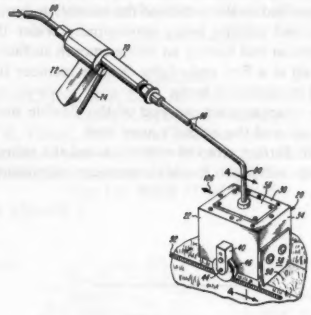
whereby a moving web may be carried through said coating zone with said film bearing thereagainst for at least said critical time interval which is controllable as a function of the relative position of said pressure generating means and said backing support means.

4,345,544

APPARATUS FOR FORMING LINES ON AN ATHLETIC PLAYING FIELD OR COURT

Jack J. Besecker, 247 N. High St., Bradford, Ohio 45308

Filed Feb. 25, 1981, Ser. No. 238,080
Int. Cl.³ B05C *5/00, 17/00*
U.S. Cl. 118—108 **4 Claims**



1. Apparatus for applying a line to the surface of an athlete field or the like in which a rope is stretched taut across a portion of the surface at the location of the desired line, and in which liquid lining material is pumped from a source thereof through an elongate flexible hose, comprising:

valve structure joined to the elongate flexible hose,

an elongate rigid tube having an end thereof attached to the valve structure,

a housing positioned adjacent the surface and joined to the opposite end of the elongate rigid tube, the housing having a pair of opposed side walls and a pair of opposed end walls, one of the end walls being a forward end wall and the other end wall being a trailing end wall, the housing having an opening in the bottom portion thereof, a pair of guide and support wheels, there being a guide and support wheel attached to each of the side walls of the housing for rotation with respect thereto, each of the guide and support wheels being adapted to engage the rope and to support the housing as the housing is supported by both of the guide and support wheels and as the rope is engaged by one of the guide and support wheels and guides movement thereof and thus guides movement of the housing along the rope,

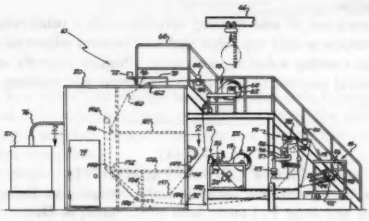
the flexible hose conducting liquid lining material to the valve structure, the valve structure controlling flow of the liquid lining material to the elongate rigid tube, the liquid lining material flowing through the elongate rigid tube to the housing, the liquid lining material flowing within the housing between the side walls and between the end walls, the liquid lining material flowing downwardly from the housing through the opening in the bottom portion of the housing, the liquid lining material flowing upon the surface and forming a line upon the surface as one of the guide and support wheels is moved along the rope and as the movement of the housing is guided by the guide and support wheel, the elongate rigid tube serving as a handle for movement of the housing.

4,345,545

APPARATUS FOR ELECTRON CURING OF RESIN COATED WEBS

Alton K. Miller, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,722
Int. Cl.³ B05B *5/02*
U.S. Cl. 118—621 **8 Claims**



1. In apparatus for curing a wet coating on a running length web, said web being coated on one side only, by irradiating said web selectively from either the coated or uncoated side, means for transporting said web along a selected path without contacting the coated side of the web; an irradiating chamber enclosing a portion of said path, said chamber having an entrance and an exit; a source of high energy electron radiation for directing an electron beam into said chamber substantially perpendicularly to the plane of the path of said web and onto the uncoated side; an additional means located along said selected path upstream of the entrance of said chamber for deflecting said web along a second path around and past said chamber on the side of said chamber opposite said source of high energy electron radiation and back to said selected path downstream of the exit of said chamber; a second additional means downstream of the exit of said chamber for deflecting said web from said second path into the exit of said chamber along said selected path but in the opposite direction; whereby when the web is transported only by the means for transporting said web along a selected path, the web is directly irradiated on the uncoated side, but when it is transported by said means to transport and said additional means it is directly irradiated on the coated side, but in neither case is the coated side contacted by the transport means prior to the irradiation.

4,345,546

APPARATUS FOR COATING ITEMS

Hermann P. Weber, 5506 Beckford Ave., Tarzana, Calif. 91356

Filed Jun. 15, 1981, Ser. No. 273,461
Int. Cl.³ B05C *3/02, 3/10*
U.S. Cl. 118—675 **9 Claims**

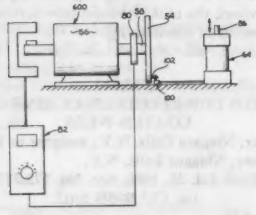
1. Apparatus for dip-coating items, said items having a top edge, a central portion, and a bottom edge, said apparatus comprising:

a rack for supporting a plurality of items to be coated;

a flexible cord having a first end coupled to said rack and a second end coupled to a rotatable drive means, whereby said rack is suspended above the surface of a volume of coating solution and is coupled to said rotatable drive means;

said drive means providing rotational movement to said second end of said flexible cord;

whereby rotation of said drive means causes vertical reciprocal movement of said rack and items to be coated, such that said items are immersed into said coating solution and



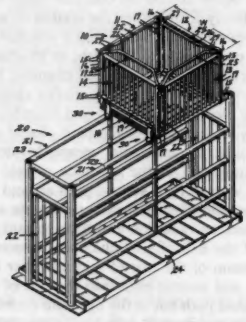
drawn out of said coating solution with a relatively low velocity as said top edge and said bottom edge exit from said coating solution, and with a higher velocity as the central portion of said items exit from said coating solution.

4,345,547

CRATE CRIB ATTACHMENT

Michael D. Lynch, Burbank, S. Dak., assignor to Delmar J. Lynch and John P. Lynch, both of Burbank, S. Dak.

Filed Feb. 23, 1981, Ser. No. 237,571
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 **11 Claims**



1. In combination:

(a) a farrowing crate, said crate including a plurality of upwardly extending wall members defining an interior space therebetween;

(b) a crate crib attachment for newborn animals, said attachment being proportionally smaller than said farrowing crate and having a floor and a plurality of upwardly extending side walls defining a containing space therebetween, said plurality of side walls including a pair of opposing side walls having lowermost portions defined by a pair of spaced apart rod members each extending across the width of said respective side wall; and

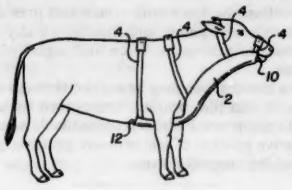
(c) means for mounting said crib attachment to a topmost portion of said farrowing crate to keep the newborn animals contained in said crib attachment in close proximity to a mother animal located in said farrowing crate, said mounting means including a plurality of mounting brackets each having means for securing a respective portion of said rod member pair to said mounting bracket, including means for attaching said mounting bracket to a segment of said farrowing crate topmost portion.

4,345,548

THROAT PROTECTOR

Clifton T. Krebs, Box 297, Vernon, British Columbia, Canada (V1T 6M2), and Leonard B. Krebs, General Delivery, Fort Steele, British Columbia, Canada

Filed Jan. 5, 1981, Ser. No. 222,578
Int. Cl.³ A01K *29/00*; B68C *5/00*
U.S. Cl. 119—108 **5 Claims**



1. A neck protector for an animal to be roped the protector comprising:

a flexible member comprising a first portion, relatively narrow, to extend substantially horizontally between the animal's fore legs and a second portion extending from the first portion and adapted to extend vertically and around the neck of the animal sufficiently to protect the animal's windpipe and to the mouth of the animal, under the jaws; said second portion being substantially wider than said first portion and having an inside smooth surface;

a first strap at a first end of the flexible member to extend around the animal's body;

a second strap at a second end of the flexible member to extend around the animal's nose; and

at least one further strap to extend around the animal's neck the straps serving to locate the protector in position on the animal.

4,345,549

STEAM-GENERATOR WITH IMPROVED FACILITIES FOR REPLACEMENT OF PARTS

Riccardo Colmano, Legnano, Italy, assignor to Ansaldo Societa per Azioni, Genoa and C.N.E.N. Comitato Nazionale per l'Energia Nucleare, Rome, both of, Italy

Filed Dec. 17, 1979, Ser. No. 104,240
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—34 **11 Claims**

1. A vertical steam-generator having natural circulation in a vertical cylindrical vessel having a removable top cover and containing:

a bundle of U-shaped tubes being fastened to a tubeplate and housed in a shell;

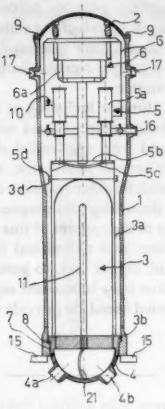
said U-shaped tubes having a primary heat-carrier fluid medium flowing therethrough and being immersed in a secondary fluid medium;

a steam-separator detachably mounted above said bundle of tubes;

a drying unit detachably mounted above said steam-separator and fastened to said vessel by means of springs which are kept under compression by the cover of the vessel;

said cylindrical vessel having at its lower end an inwardly extending annular ledge on which said tubeplate is detachably mounted with water-tight means;

said tubeplate with bundle of tubes and shell being coaxially aligned with said vessel by pin means;



whereby said drying unit, steam-separator and tube-plate with bundle of tubes and shell may be separately removed from said cylindrical vessel by vertical lifting.

4,345,550

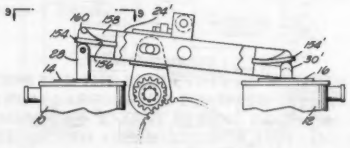
DEFLECTING ROCKER ARM FOR AN INTERNAL COMBUSTION ENGINE

Donald G. Finley, 1658 Morse Dr., San Pedro, Calif. 90732

Continuation-in-part of Ser. No. 901,171, Apr. 28, 1978, Pat. No. 4,215,660. This application May 9, 1980, Ser. No. 148,315

Int. Cl.³ F02B *75/04, 75/26*

U.S. Cl. 123—78 E **4 Claims**



1. In an internal combustion engine having a pair of cylinders, first and second pistons in each cylinder and oppositely acting in predetermined phase relationship so that the facing surfaces of the pistons are moved together and apart to define a stroke length and to at least partially define a combustion chamber, said pistons including piston rods extending outwardly therefrom, means for providing fuel to said combustion chamber, a transfer port in each cylinder, opened and closed by one of said pistons and providing air to said combustion chamber, an exhaust port in each cylinder for removing combustion products from said combustion chamber, a pivotally mounted first rocker arm having opposite ends arranged for reciprocal movement of said first pistons, means arranged for reciprocal movement with said second pistons, and a crankshaft rotatably driven by pivotal movement of said rocker arm, the improvement comprising:

a spring member carried on each end of said rocker arm, said spring member having a substantially planar surface bearing against the outer end of the respective piston rod so as to be interposed between said rocker arm and each piston whereby to permit said pistons to move apart by deflecting the respective spring, during combustion, in advance of said crankshaft.

4,345,551

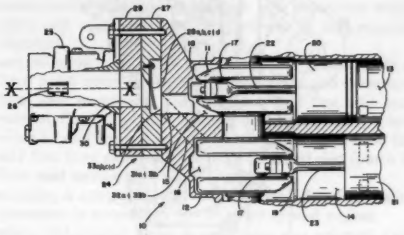
AIR AND FUEL INDUCTION SYSTEM FOR A TWO CYCLE ENGINE

James L. Bloemers, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 19, 1981, Ser. No. 312,559

Int. Cl.³ F02B *33/28, 75/20*

U.S. Cl. 123—59 B **11 Claims**



1. In a two cycle engine having at least two adjacent horizontal cylinders positioned aligned one above the other each having a separate closed crankcase, an air and fuel induction system comprising:

(a) a single horizontally positioned carburetor having a single metering system for supplying an air and fuel mixture to both cylinders

(b) an induction passageway for each cylinder connecting between the carburetor and each crankcase, each induction passageway having an opening at about the same elevation and each opening having about the same cross sectional area, and

(c) a reed valve positioned adjacent the carburetor throat and at the entrance to each of the induction passageways, said reed valve including at least one flat reed positioned directly across and closing the entrance to each of the induction passageways.

4,345,552

ROCKER HOUSING AND ROCKER COVER

Edward W. Kasting, Seymour; Richard E. Glasson, and Bryan W. Swank, both of Columbus, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

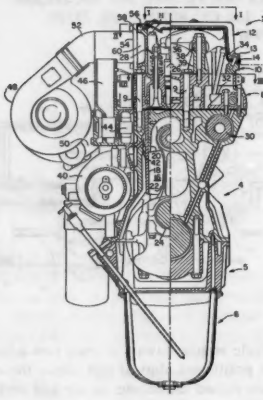
Filed Dec. 18, 1979, Ser. No. 104,791

Int. Cl.³ F01M *9/10*

U.S. Cl. 123—90.38 **15 Claims**

1. A rocker housing for use in an internal combustion engine having a plurality of cylinders, a cylinder head with a plurality of intake and exhaust passages formed therein to permit the flow of gases respectively to and from the cylinders, a plurality of intake and exhaust valve assemblies mounted on the cylinder head to open and close respective intake and exhaust passages formed in the cylinder head, and a rocker arm mechanism in operative engagement with the intake and exhaust valve assemblies to control the flow of gases respectively into and out of the cylinders, said rocker housing comprising a casing including an upright front wall, an upright back wall and a pair of side walls, said front wall having a greater height than said back wall and said side walls joining said front and back walls at right angles to form an open rectangular box for surrounding the rocker arm mechanism, an opening formed in said casing to receive air from an external source, and an air collection and distribution means also formed in said casing in fluid communication with said opening to collect air received at said opening and distribute air so collected simultaneously to all of the intake passages formed in the cylinder head, said air collection and distribution means includes both a plenum in fluid communication with said opening and a plurality of passageways extending from said plenum to register respectively with the plurality of intake passages formed in the cylinder head, said

front wall including a generally planar, vertically oriented outer surface containing a recess extending along substantially the entire horizontal width of said front wall, said plenum being formed by the exterior surface of said recess, and securing means for securing said casing to the cylinder head, said securing means including a pair of bosses formed on opposed sides of each said passageway, each said boss containing a vertically oriented hole for receiving a bolt for attaching said casing to the cylinder head.

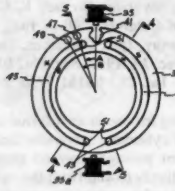


4,345,553

MULTIPLE STEP ADVANCE WITH MAGNETIC TRIGGER ROTOR

Robert T. Magrane, Reno, Nev., and Nando A. Fontana, West Springfield, Mass., assignors to Eltra Corporation, Toledo, Ohio

Filed Mar. 25, 1980, Ser. No. 133,771
Int. Cl.³ F02P *3/06*
U.S. Cl. 123—149 C **11 Claims**



1. An ignition system for use with a small internal combustion engine having at least one cylinder including a piston therein, comprising:

ignition means responsive to trigger signals for producing ignition pulses in said cylinder of said engine;

trigger means for producing said trigger signals in timed relation to the movement of said piston in said cylinder;

said trigger means including a trigger coil and a magnetic trigger rotor rotated past said trigger coil in synchronism with the movement of said piston for generating a trigger signal in said coil;

said trigger rotor being formed of a magnetically conductive material, having arcuate slots formed therein, and having first and second magnetic means disposed in said slots;

said first and second magnetic means being magnetized so that the first magnetic means has a first polarity magnetic pole disposed towards the periphery of said rotor and so that said second magnetic means has a second polarity magnetic pole disposed towards the periphery of said rotor;

said trigger rotor having a radial slot formed therein between said arcuate slots so that the rotor has a magnetic field which changes polarity across said radial slot to generate a trigger signal of maximum magnitude when said radial slot of said rotor is rotated past said trigger coil for producing a trigger signal effective at relatively low speeds of said engine;

said trigger rotor further including at least one cylindrical hole formed therein adjacent said radial slot and circumferentially spaced from said radial slot and spaced from the radial periphery of said rotor, said cylindrical hole being formed with its axis parallel to the axis of rotation of said rotor, for distorting said magnetic field and for providing a change in the amount of flux passing through said trigger coil when said cylindrical hole of said rotor is rotated past said trigger coil, to generate a trigger signal which is effective only when said engine has accelerated to a predetermined speed, to provide an advanced ignition pulse.

4,345,554

VEHICLE ENGINE REMOTE STARTER CONTROL AND PROTECTIVE SYSTEM

Donald M. Hildreth, 4011 Garden Ave., Los Angeles, Calif. 90039, and Edward P. Tyler, 10644 Tuxford St., Sun Valley, Calif. 91352

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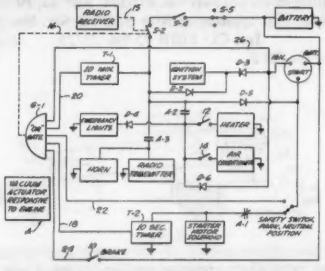
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—179 BG **7 Claims**



1. A remotely controlled starting and control system for an internal combustion engine of an unattended vehicle, in which switching means are operative upon receipt of a remotely transmitted command signal to connect and disconnect an associated starter motor and ignition system to an energy source, the improvement comprising:

a solenoid actuated switch for controlling the operation of the starter motor;

normally closed contacts in an energizing circuit of said solenoid;

means responsive to engine operation for continuously generating an output signal indicative of the engine operating RPM;

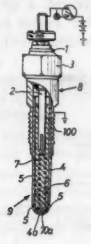
means controlled by said output signal for actuating the normally closed contacts to an open position, when the RPM is less than a preset level for a predetermined first time interval; and

means operable in response to the operation of said actuating means to open said normally closed contacts, for preventing reclosure of said contacts until the expiration of a predetermined second time interval.

4,345,555
SELF-HEATING IGNITION PLUG

Yujiro Oshima; Yoshiyasu Fujitani; Hideaki Muraki; Shiroh Kondoh, and Kouji Yokota, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Mar. 14, 1980, Ser. No. 130,589
Claims priority, application Japan, Mar. 20, 1979, 54-32870
Int. Cl.³ F02P *19/00, 23/02*
U.S. Cl. 123—272 38 Claims



1. A self-heating type ignition plug comprising a base portion having a fixing portion formed on an outer wall thereof and a terminal insulatedly provided therein and connected to an electrical source,

an ignition means integrally connected to the said base portion, having an ignition surface formed on a wall surface thereof and composed of a catalyst comprising a transition metal, and

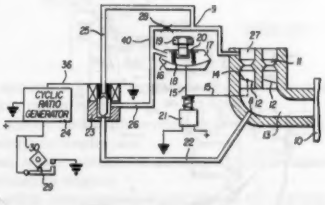
a heating means comprising a resistive exothermic element connected to the terminal of said base portion, the resistive exothermic element being provided adjacent to the ignition surface within the ignition means,

whereby fuel may be ignited and burned as a whole by said ignition surface of the catalyst which is maintained at preset temperature due to an oxidation reaction of said catalyst and the fuel in contact therewith, after the heating means is deenergized.

4,345,556
PROCESS FOR THE REDUCTION OF NOXIOUS GASES FROM CARBURETOR-EQUIPPED INTERNAL COMBUSTION ENGINE DURING DECELERATION PERIODS AND APPARATUS FOR APPLYING SAID PROCESS

Jean P. Crouillere, Taverny, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 30, 1980, Ser. No. 154,764
Claims priority, application France, Jun. 19, 1979, 79 15677
Int. Cl.³ F02D *1/04;* F02B *75/10;* F02D *11/08;* F02M *1/14*
U.S. Cl. 123—327 4 Claims



1. A process for the reduction of emissions of noxious gases from a carburetor-supplied internal combustion engine having at least one butterfly gas valve, an intake manifold, a membrane chamber, a membrane dividing said membrane chamber into first and second compartments, a three-way solenoid valve, a modulated cyclic ratio generator, a first hose, a second hose, a third hose, a fourth hose, and restriction means disposed in said fourth hose, wherein said process comprises:

communicating said first hose with said three-way solenoid valve and with said intake manifold at a first point downstream from said carburetor;

communicating said second hose with said three-way solenoid valve and with said intake manifold at a second point upstream from said carburetor;

communicating said third hose with said three-way solenoid valve and with said first compartment of said membrane chamber;

communicating said fourth hose with said second hose at a third point upstream from said carburetor and downstream from said membrane chamber such that first and second parallel fluid flow paths are effected from said solenoid valve to said second point wherein said second hose forms said first flow path and said third hose and said fourth hose form said second flow path;

generating a control signal with said modulated cyclic ratio generator in proportion to the speed of said engine;

sending said control signal to said three way solenoid valve;

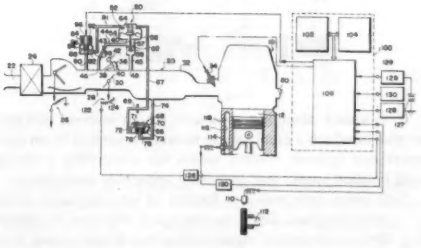
actuating said solenoid valve proportional to said engine speed with said control signal;

partially opening said at least one butterfly valve via actuation of said three-way solenoid valve during deceleration of said engine such that said partial opening is proportional to both said speed of said engine and proportional to the level of vacuum in said intake manifold of said engine so as to reduce the emission of noxious gases during said deceleration of said engine.

4,345,557
IDLE SPEED CONTROL METHOD AND SYSTEM FOR AN INTERNAL COMBUSTION ENGINE OF AN AUTOMOBILE VEHICLE

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 28, 1980, Ser. No. 154,051
Claims priority, application Japan, May 29, 1979, 54-65663
Int. Cl.³ F02D *11/10*
U.S. Cl. 123—339 63 Claims



1. An intake air flow rate control system for a vehicle internal combustion engine in which either feedback control or open loop control is selectively carried out, in said feedback control, a feedback control ratio being determined based on an actual engine speed and a reference engine speed so that a difference between said actual engine speed and reference engine speed is reduced to zero and in said open loop control, an open loop control ratio being determined corresponding to an engine or engine coolant temperature,

the system comprising in combination:

means for sensing said engine or engine coolant temperature;

means for sensing engine speed,

means for sensing engine load,

a first means for determining said reference engine speed corresponding to said sensed engine or engine coolant temperature;

a second means for determining said open loop control ratio

based on said sensed engine or engine coolant temperature and said sensed engine load;

a third means for sensing engine driving conditions and for selecting in response thereto one of said feedback control and said open loop control;

a fourth means responsive to said third means selecting said feedback control for determining said feedback control ratio based on said sensed engine speed and said reference engine speed;

a fifth means responsive to said third means selecting said open loop control for correcting said open loop control ratio in response to acceleration or deceleration of the vehicle;

a sixth means for limiting maximum and minimum values of said feedback and open loop control ratios for improving the response characteristics of the control system; and

a seventh means for operating said first to sixth means in a predetermined order.

4,345,558

KNOCK DETECTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

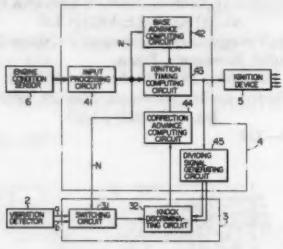
Hiroaki Yamaguchi, Anjo; Tadashi Hattori, and Yoshinori Ootsuka, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 31, 1980, Ser. No. 135,929

Claims priority, application Japan, Apr. 28, 1979, 54/53143; Jun. 15, 1979, 54/76009

Int. Cl.³ F02D 5/04

U.S. Cl. 123—425 **6 Claims**



1. A knock detecting apparatus for an internal combustion engine in which a combustible mixture is ignited by an ignition spark and ignition control means for controlling a timing of said ignition spark, said detecting apparatus comprising:

first means responsive to knocks of said engine at around a predetermined first frequency and effective to produce a first knock output signal indicative of said engine knocks;

second means responsive to knocks of said engine at around a predetermined second frequency and effective to produce a second knock output signal indicative of said engine knocks, said second frequency being lower than said first frequency;

means responsive to an operating condition of said engine and effective to produce a condition output signal indicative of said operating condition; and

means responsive to said condition output signal and effective to selectively apply one of said first and second output signals to said ignition control means to thereby control said timing of ignition spark, said first and second output signals being selected in response to said condition output signals being selected in response to said condition output signal indicating that said operating condition is higher and lower than a predetermined reference value, respectively.

4,345,559

APPARATUS FOR DAMPING BOUNCE OSCILLATIONS IN AN INTERNAL COMBUSTION ENGINE

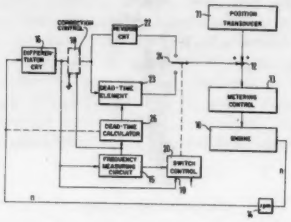
Thomas Küttner, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 122,100

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2906782

Int. Cl.³ F02B 47/00

U.S. Cl. 123—435 **26 Claims**



1. An apparatus for damping low-frequency bounce oscillations in an internal combustion engine having first signal generating means for generating at least one operational signal and a fuel metering means for supplying fuel to the engine in accordance with said at least one operational signal, which comprises:

rpm signal generating means for generating an rpm signal proportional to the engine rpm;

signal differentiation means, connected to receive said rpm signal, for generating an rpm differential signal proportional to the rate of change of said rpm signal with respect to time;

countercontrol signal generating means, connected to receive said rpm differential signal, for supplying a damping signal to said fuel metering means upon the occurrence of predetermined characteristics of said rpm differential signal indicating bounce-induced oscillations in the engine speed, wherein said fuel metering means enriches or leans said fuel in said response to said damping signal.

4,345,560

ELECTRONICALLY CONTROLLED CARBURETOR

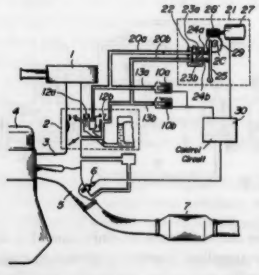
Koyo Nakamura, and Hatsuo Nagaishi, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 14, 1980, Ser. No. 112,118

Claims priority, application Japan, Jan. 16, 1979, 54-3762

Int. Cl.³ F02M 7/12

U.S. Cl. 123—440 **18 Claims**



1. An electronically controlled carburetor, which comprises an oxygen sensor provided in an exhaust passage of an internal

combustion engine for detecting indirectly an air to fuel ratio of a mixture gas, an air to fuel ratio correction means for correcting the air to fuel ratio of the mixture gas to be supplied to said internal combustion engine and a first control circuit for forming a first control signal to be applied to said air to fuel ratio correction means for removing a deviation of said air to fuel ratio detected indirectly by said oxygen sensor from a first target value, based on a result of comparison between said air to fuel ratio and said first target value, further comprising:

a second control circuit for forming a second control signal which corresponds to a deviation of said first control signal from a second target value, based on a result of comparison of said first control signal and said second target value and

an air to fuel ratio range correction means for correcting a controllable range of said air to fuel ratio of said mixture, based on said control signal;

a speed of response of said air to fuel ratio range correction means being settled far lower than that of said air to fuel ratio correction means;

said air to fuel ratio correction means comprising a plurality of main air bleeders and a plurality of auxiliary air bleeders which are controlled by said first control signal and said air to fuel ratio range correction means comprising a plurality of controlling air bleeders which are controlled by said second control signal;

said plurality of controlling air bleeders being formed of a plurality of needle valves which are controlled commonly by a pressure means under the control of said second control signal.

4,345,561

AIR-FUEL RATIO CONTROL METHOD AND ITS APPARATUS

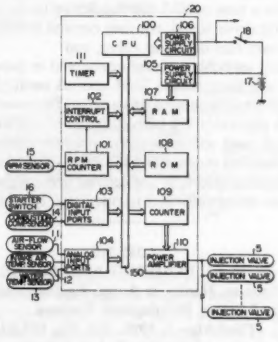
Toshio Kondo, Anjo; Yasuo Sagisaka, Kariya; Masahiko Tajima, Takahama, and Akio Kobayashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 2, 1980, Ser. No. 136,706

Claims priority, application Japan, Apr. 5, 1979, 54/41360

Int. Cl.³ F02B *3/00*; **F02G** *3/00*; **F02D** *5/00*; **G05B** *15/00*

U.S. Cl. 123—440 **6 Claims**



1. An apparatus for controlling an air-fuel ratio of a combustion engine comprising:

intake sensor means for sensing an intake condition of said combustion engine;

rotation sensor means for sensing a rotation speed of said combustion engine;

combustion components sensor means for sensing combustion components representative of an air-fuel ratio of mixture supplied to said combustion engine;

integrator means for integrating an output of said combustion components sensor means;

read/write memory means for storing a plurality of correction values in corresponding storage locations addressed by outputs of said intake sensor means and said rotation sensor means;

comparator means for comparing an output of said integrator means with predetermined upper and lower limit values;

means for correcting one of said correction values in increasing and decreasing directions when an output of said comparator means indicates that said output of said integrator means is inside said upper and lower limit values, said one of said correction values being read out from one of said storage locations addressed by said outputs of said intake sensor means and said rotation sensor means and an output of said correcting means being written in said one of said storage locations as said one of correction values;

means for replacing all of said correction values by a predetermined reference value when said output of said comparator means indicates that said output of said integrator means is outside said upper and lower limit values, said predetermined reference value being written in said storage location as said correction values; and

control means for controlling an air-fuel ratio of said combustion engine in accordance with said one of said correction values.

4,345,562

METHOD AND APPARATUS FOR REGULATING THE FUEL-AIR RATIO IN INTERNAL COMBUSTION ENGINES

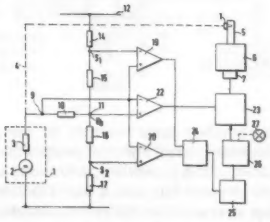
Ulrich Drews, Vahingen-Pulverdingen; Peter Werner, Wiernsheim, and Werner Möhrle, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,435

Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919220

Int. Cl.³ F02B *3/00, 33/00*

U.S. Cl. 123—440 **9 Claims**



1. In a method of regulating the fuel-air ratio of the operational mixture intended for combustion in an internal combustion engine utilizing a λ sensor, which is connected with a regulating apparatus for influencing the fuel-air ratio, and further having an apparatus for monitoring the operational readiness of the λ sensor, wherein in order to ascertain the internal sensor resistance influencing the operational readiness of the sensor a reference voltage, with the interposition of a resistor, is supplied to an output of the λ sensor to oppose the λ sensor voltage and the resultant voltage at the λ sensor output is examined as to a minimum jump indicating the operational readiness of the λ sensor by means of two comparison devices having different threshold voltages whose output signals are logically linked and the signal resulting therefrom is evaluated as a standard for the operational readiness by an evaluation circuit which generates a first signal, indicating the operational readiness of the λ sensor, and a second signal indicating the operational unreadiness of the λ sensor, the improvement which comprises the steps of:

comparing the resultant voltage with the reference voltage and generating a comparison signal indicating the dispo-

sition of the resultant voltage relative to the reference voltage; and

transforming the comparison signal into a correction signal for varying the fuel-air ratio, utilizing the regulating apparatus, which is connected to receive the comparison signal.

4,345,563

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

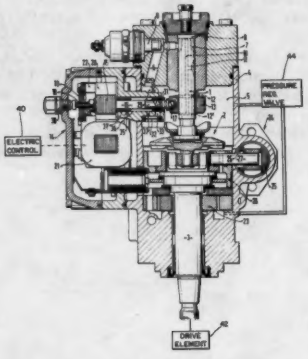
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,117

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929176

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—458 **6 Claims**



1. In a fuel injection pump assembly for internal combustion engines, comprising: a fuel injection pump; a fuel supply pump; means for driving both pumps in synchronism; a housing defining a suction chamber into which fuel is delivered by the fuel supply pump; a pressure control valve connected to the suction chamber for controlling the pressure of the fuel in the suction chamber as a function of engine rpm; a fuel quantity adjustment member; and an rpm governor connected to the fuel quantity adjustment member for adjustment of the fuel quantity adjustment member, the improvement in the rpm governor, comprising:

a pressure relief chamber;

a fuel connecting line connecting the pressure relief chamber to the suction chamber;

a rotatably mounted shaft; and

guide means surrounding said rotatably mounted shaft; wherein:

(i) the rotatably mounted shaft includes an eccentric end portion which directly engages the fuel quantity adjustment member and controls the adjustment thereof;

(ii) the rotatably mounted shaft defines first means and the guide means defines second means; and

(iii) both said first means and said second means cooperate to form a valve controlling the extent of opening of the fuel connecting line as a function of the rotation of said rotatably mounted shaft.

4,345,564

FUEL INJECTION VALVE DRIVE SYSTEM

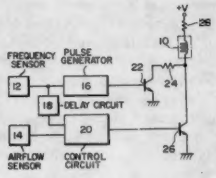
Yoshihisa Kawamura, Fujisawa; Kesao Matsuto, and Masaaki Saito, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 28, 1979, Ser. No. 107,832

Claims priority, application Japan, Aug. 1, 1979, 54-1188

Int. Cl.³ F02D *5/02*; H01F *7/18*

U.S. Cl. 123—490 **9 Claims**



1. A fuel injection valve drive system for use in an internal combustion engine provided with at least one fuel injection valve operated by a solenoid coil having positive and negative terminals, the positive terminal of said solenoid coil being coupled to a power source, said drive system comprising:

(a) a reference pulse generator for generating a train of reference pulses in synchronism with the rotation of said engine;

(b) a first drive signal generator responsive to each reference pulse from said reference pulse generator for generating a first drive signal having a constant pulse width;

(c) a second drive signal generator for generating a second drive signal having a pulse width dependent upon at least one engine operating parameter, the second drive signal occurring a predetermined time period after the beginning of the first drive signal from said first drive signal generator;

(d) first switching means connected in series with said solenoid coil, said first switching means responsive to the first drive signal from said first drive signal generator for permitting a first current to flow through said solenoid coil for a time period corresponding to the pulse width of the first drive signal, the first current being insufficient to open said fuel injection valve; and

(e) second switching means connected in parallel with said first switching means, said second switching means responsive to the second drive signal from said second drive signal generator for permitting a second current to flow through said solenoid coil a predetermined time period after the first current and for a time period corresponding to the pulse width of the second drive signal, the second current being sufficient to open said fuel injection valve.

4,345,565

FUEL PUMPING APPARATUS

Harry S. Bottoms, Henley in Arden, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 1, 1980, Ser. No. 145,831

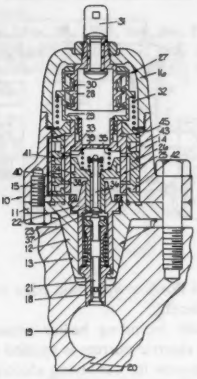
Claims priority, application United Kingdom, Dec. 7, 1979, 7942372

Int. Cl.³ F04B *49/06*; F02M *39/00*

U.S. Cl. 123—497 **6 Claims**

1. A fuel pumping apparatus for supplying fuel under pressure to a fuel injection nozzle of an internal combustion engine comprising a plunger reciprocable within a bore, a piston connected to the plunger and of larger diameter than the plunger, valve means operable to apply a fluid under pressure to one surface of the piston to effect movement of the piston and the plunger thereby to cause fuel contained within the bore to be delivered to the injection nozzle, and electrically controlled actuating means for the valve means characterised in that the piston is constructed as a double acting piston and the

valve means is movable from an intermediate position in which the supply of fluid under pressure to the opposite ends of the cylinder containing the piston is prevented, towards one or other operating positions in which fluid under pressure is supplied to one end of the cylinder and allowed to escape from the other end of the cylinder and vice versa, the apparatus



further comprising resilient means acting between the piston and an output member of the actuating means, the arrangement being such that the extent of the return movement of the piston and plunger following delivery of fuel, is determined by the force generated by the actuating means and which is at least in part, opposed by the force exerted by the resilient means.

4,345,566

FUEL PUMPING APPARATUS

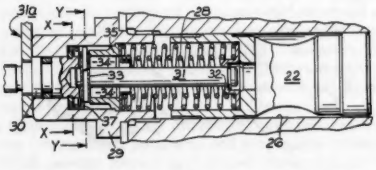
Michael T. Hammock, Holmer Green, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 5, 1980, Ser. No. 213,594

Claims priority, application United Kingdom, Jan. 22, 1980, 8002111

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—502 **5 Claims**



1. A fuel pumping apparatus for supplying fuel to a compression ignition internal combustion engine, and comprising an injection pump operable in use in timed relationship with an associated engine, a pump for supplying fluid at a pressure which varies with the speed at which the apparatus is driven, a cylinder, a fluid pressure operable piston in the cylinder, said piston being responsive to the pressure of said fluid to vary the timing of delivery of fuel by the apparatus such that with increasing speed the timing of delivery of fuel is advanced, an end closure for the cylinder, resilient means biasing the piston in a direction away from said end closure, said piston being moved against the action of said resilient means to advance the timing of delivery of fuel by the injection pump, a shaft mounted in said end closure for angular movement about the axis of said cylinder, a lever mounted on said shaft and operable in use when it is required to start the associated engine, to move the shaft from an inoperative position to an operative position, said shaft having a hollow end portion presented to the piston and defining a pair of axially extending slots, an actuating rod having one end located within said hollow end portion and mounting an abutment which acts as a stop to determine the extent of movement of the piston under the action of the resilient means, a pin mounted in said actuating rod for engagement by the walls of said slots, an annular member surrounding the hollow end portion of the shaft, said member defining a pair of cam profiles for engagement by the opposite end portions of the pin, each cam profile defining three settings for the pin, the first of which is a normal running position, the second of which is the cold start position in which the piston is allowed to move to a position in which the timing is retarded as compared with the normal running position, and a third setting in which the piston is allowed to move to a position in which the timing is advanced as compared with the normal running positions, said pin being moved from said first position to the second position when the shaft is moved from the inoperative to the operative position, the pin being moved at least in part by further resilient means from said second position to said third position when the piston is subjected to fluid pressure.

4,345,567

FUEL SUPPLY SYSTEM

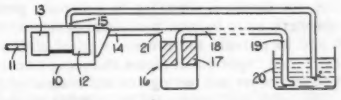
Chandrasegaram Balachandran, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 17, 1980, Ser. No. 141,157

Claims priority, application United Kingdom, May 12, 1979, 7916558

Int. Cl.³ F02B *77/00, 33/00*

U.S. Cl. 123—510 **4 Claims**

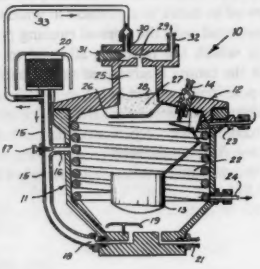


1. A fuel supply system for a diesel engine comprising a fuel pumping apparatus which includes a high pressure pump which in use supplies fuel at high pressure to the injection nozzles of the engine, and a low pressure feed pump which draws fuel through a fuel inlet of the apparatus and supplies fuel to the high pressure pump, the apparatus also having a drain outlet through which fuel and air collecting within a cavity of the apparatus can escape, the system further including a filter and inlet means connecting the filter to the fuel inlet and through which fuel is drawn by said feed pump from a supply tank to said pumping apparatus via the filter, a reservoir attached to the filter and fluidly interposed between said supply tank and said pumping apparatus, fluid passage means connecting said reservoir to said fuel pumping apparatus for conducting fuel from said pumping apparatus to said reservoir for maintaining the reservoir full of fuel during operation of the engine, outlet passage means fluidly connecting said reservoir to said supply tank, said outlet passage being located in said reservoir to define a predetermined level of fluid in said reservoir, and restricted passage means fluidly connecting said reservoir and said inlet means to by-pass the filter and fluidly connect the pumping apparatus and said reservoir so that fuel will be supplied to said pumping apparatus at a restricted rate from said reservoir via said restricted passage means if fuel in said supply tank is exhausted.

4,345,568
MULTI-FUEL VAPOR CHARGER CARBURETION SYSTEM AND DEVICE THEREFOR

Adolfo P. Alegre, 119 Bignay St., Quezon City; Armando E. Guidote, Antipolo, Rizal, and Alfonso G. Puyat, No. 7 Caimito St., Forbes Park, Makati, Metro Manila, all of Philippines

Filed Mar. 24, 1980, Ser. No. 132,786
Claims priority, application Philippines, Sep. 7, 1979, 23009
Int. Cl.³ F02M 13/04
U.S. Cl. 123—522 5 Claims



1. A fuel vapor charge producing device comprising a pure liquid fuel or mixture container which can be of any desired shape and material with a cover and a float secured inside said device to control the inflow of pure liquid fuel or mixture into the container, a fuel or mixture inlet-valve made on said container for the entry of fuel or mixture, an air inlet adapted to allow the entry of air into said container above the liquid or mixture level and another air inlet below the fuel or mixture level such that the incoming air comes in contact with the liquid fuel or mixture to aid and agitate in emulsifying and vaporizing said fuel or mixture evenly within the range of the operating temperature, and a vapor outlet means connected to the intake manifold and/or to the air inlet of the carburetor of a conventional internal combustion engine, such that when the engine runs, the device is subjected to a vacuum pressure to force atmospheric air to be sucked into said device through the air inlets and to provide the proper or ideal air/fuel or or mixture ratio, said vapor outlet means including a venturi tube mounted on said cover and having one end connected to an air pipe and the other end connected by conduit means to the intake manifold and/or air inlet of the carburetor of an engine, a vapor outlet passage extending from said container through said cover into said venturi tube whereby a flow of vapor is induced by the venturi effect of the the venturi tube.

4,345,569
INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Tadashi Hattori; Siniti Mukainakano, and Hitoshi Yoshida, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 27, 1979, Ser. No. 107,638
Claims priority, application Japan, Dec. 27, 1978, 53/162709
Int. Cl.³ F02M 31/00
U.S. Cl. 123—549 10 Claims

1. An intake system for an internal combustion engine comprising:

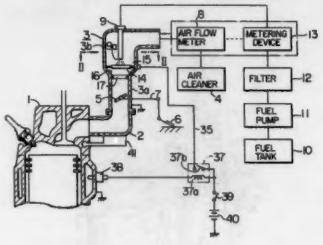
an intake pipe structure,

fuel supply means for supplying fuel into said intake pipe structure to form an air-fuel mixture,

an intake manifold connected between said intake pipe structure and cylinders of said engine for distributing the air-fuel mixture into said cylinders,

a throttle valve disposed in said intake pipe structure between said fuel supply means and said intake manifold for controlling an amount of the air-fuel mixture to be charged into said cylinders,

substantially imperforate baffle means disposed in said intake pipe structure between said fuel supply means and said throttle valve in opposition to said fuel supply means with a predetermined distance from the latter for impingement of fuel therefrom on said baffle means, and having an outer edge spaced from an inner wall surface of said intake pipe structure to define an opening therebetween, whereby



impinged fuel flows toward said edge and is atomized by flow of air thereby,

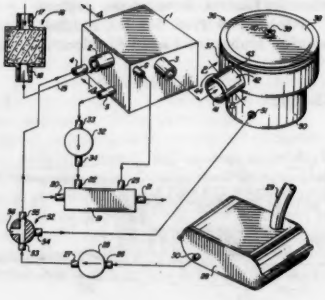
said baffle means including heater means adapted to be heated when electric current is applied thereto, and

power supply means for supplying electric current to said baffle means.

4,345,570
FUEL HEATING APPARATUS FOR VEHICLES

Paul W. McNeece, P.O. Box 728, Ruston, La. 71270

Filed Sep. 25, 1980, Ser. No. 190,739
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 11 Claims



1. A fuel heating apparatus for a vehicle having a carburetor comprising:

(a) a vaporizer box for mixing fuel and air and having an air inlet and a fuel-air mixture outlet, and a cool fuel inlet, a cool fuel discharge and a hot fuel inlet, and further including float means for maintaining a desired level of said fuel inside said vaporizer box;

(b) heat exchange means in cooperation with said vaporizer box for receiving fuel from said vaporizer box through said cool fuel discharge, heating said fuel to vaporize at least a portion of said fuel, and discharging said fuel to said vaporizer box through said hot fuel inlet; and

(c) a mixing chamber in cooperation with said vaporizer box and having a fuel-air inlet for receiving a mixture of said at least a portion of said fuel which is vaporized, and said air from said fuel-air outlet of said vaporizer box and further mixing said at least a portion of said fuel which is vaporized and said air and introducing said at least a portion of

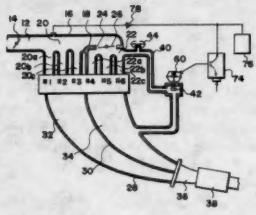
said fuel which is vaporized and said air as a vaporized fuel-air mixture into said carburetor of said vehicle.

4,345,571

INTERNAL COMBUSTION ENGINE

Haruhiko Iizuka, Yokosuka, and Fukashi Sugasawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 28, 1980, Ser. No. 135,072
Claims priority, application Japan, Mar. 30, 1979, 54-37781
Int. Cl.³ F02M *25/06;* F02D *17/02*
U.S. Cl. 123—568 **7 Claims**



1. An internal combustion engine comprising:
(a) a plurality of cylinders split into first and second groups;
(b) an air intake passage provided therein with a throttle valve and divided downstream of said throttle valve into first and second branches for supplying air to said first and second groups of cylinders, respectively, said second intake passage branch provided near its inlet with a stop valve normally open to allow the flow of air into said second group of cylinders;
(c) an exhaust passage through which exhaust gases are discharged from said cylinders to the atmosphere;
(d) an EGR passage having its one end opening into said exhaust passage and the other end opening into said second intake passage branch, said EGR passage having therein an EGR valve adapted to normally close so as to interrupt exhaust gas recirculation into said second intake passage branch and to open so as to allow exhaust gas recirculation thereinto when the engine load is below a predetermined value;
(e) split engine control means responsive to engine load conditions for cutting off the supply of fuel to said second group of cylinders and closing said stop valve to cut off the flow of air to said second group of cylinders, thereby rendering said second group of cylinders inactive when the engine load is below the predetermined engine load value; and
(f) attenuation means for attenuating pressure waves resulting from exhaust pulsations and propagated through said EGR passage toward said second intake passage branch sufficient to substantially prevent exhaust gases recirculated in said second intake passage branch from escaping through said stop valve into said first intake passage branch when said second group of cylinders is inactive.

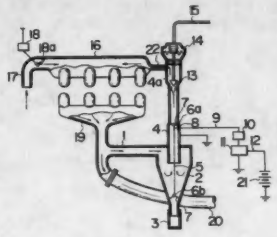
4,345,572

ENGINE EXHAUST GAS REFLUX APPARATUS

Nagatoshi Suzuki, 5-7-7, Kugahara, Ohta-ku, Tokyo, Japan (146); Sadaakira Araki, 2081, Izumi, Komae-shi, Tokyo, Japan (201), and Soichi Kawazoe, 452-72, Kazigaya-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, Japan (247)

Filed Dec. 18, 1980, Ser. No. 217,749
Claims priority, application Japan, Aug. 7, 1980, 55-112065[U]
Int. Cl.³ F02M *25/06;* F01N *3/02, 3/12*
U.S. Cl. 123—568 **6 Claims**

1. An engine exhaust gas reflux apparatus provided with an exhaust manifold, a dust collector linked to said exhaust manifold and a control valve and substantially comprising an electrostatic filter type discharge pipe connected to said dust collector and an intake manifold available for drawing exhaust gas from said electrostatic filter type discharge pipe thereby to preferably reduce NO_x contained in exhaust gas.

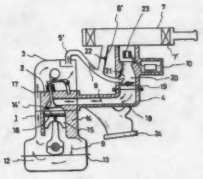


4,345,573

BLOW-GAS TREATING AND CONTROLLING SYSTEM

Haruyuki Obata, Susonoshi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 17, 1980, Ser. No. 141,170
Claims priority, application Japan, May 16, 1979, 54-59083
Int. Cl.³ F02M *23/14*
U.S. Cl. 123—572 **3 Claims**



1. A blow-by gas treating and controlling system having a blow-by gas treating pipe connected between the cylinder head cover of an engine and the barrel of a variable venturi carburetor attached to said engine, said variable venturi carburetor including a throttle valve mounted downstream of said barrel, characterized in that said blow-by gas treating pipe is connected between said cylinder head of said engine and the vacuum region of said barrel above the throttle valve of said variable venturi carburetor, said blow-by gas treating pipe is unrestricted between said cylinder head and said barrel, and a bleed pipe connected at one end to said blow-by gas treating pipe intermediate its ends and at its other end to an air cleaner attached to the suction side of said carburetor upstream of said throttle valve.

4,345,574

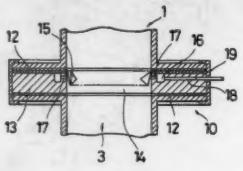
SECONDARY AIR FEEDER FOR AN INTERNAL COMBUSTION ENGINE

Tadakatsu Iwami, 374, Shikisai, Himeji-shi, Hyogo-ken, Japan

Filed Jan. 3, 1980, Ser. No. 109,402
Claims priority, application Japan, Mar. 27, 1979, 54/41633[U]
Int. Cl.³ F02M *23/12, 29/02*
U.S. Cl. 123—587 **4 Claims**

1. A secondary air feeder for an internal combustion engine, comprising a vortex chamber provided between a carburetor and a suction pipe and an air supply regulator communicating with said vortex chamber for serving as a secondary air intake,

said vortex chamber including a plurality of fins provided on the upper brim of a hollow cylindrical portion formed therein, an annular air chamber formed around said fins concentrically with a passage of said vortex chamber and a plurality of air vents communicating with the back side of said fins from said



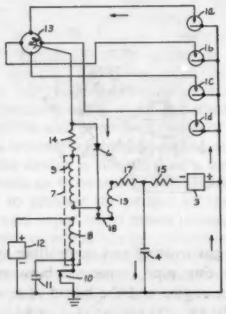
annular air chamber, each of the free ends of said fins being bent slightly, inwardly of the inner diameter of said passage, said air vents being tilted relative to said passage, and said annular air chamber being provided with an inlet pipe communicating with said air supply regulator.

4,345,575

IGNITION SYSTEM WITH POWER BOOSTING ARRANGEMENT

Adam A. Jorgensen, 1911 NW. 36 St., Oakland Park, Fla. 33309

Filed May 20, 1981, Ser. No. 265,669
Int. Cl.³ F02P *3/06, 15/00*
U.S. Cl. 123—598 **8 Claims**



1. An ignition system with power boosting arrangement for an internal combustion engine, said engine having at least one cylinder with a combustion chamber with at least one spark plug having at least one spark gap, in which an initial spark is struck from a high voltage, low current source and then maintained as an arc from a coordinated high current, low voltage source at a high energy level for an extended duration, the improvement comprising:

a high voltage ignition coil having primary and a secondary high voltage winding disposed on a magnetic core, said windings having a turns ratio such as to create in said secondary winding an electrical pulse of short duration and a potential sufficient to strike a spark in said spark gap at the time of interruption of energizing current in said primary winding,

a power source for high direct current of a voltage lower than that required to initiate a spark in said spark gap, but sufficiently high to sustain an arc across said spark gap at a predetermined high current value and for a predetermined duration once an initial spark has been struck, said power source consisting of a storage capacitor in parallel connection with a direct current power supply through a first current limiting resistor, said storage capacitor connected to said spark plug through a second limiting resistor and a first rectifier, said direct current power supply having such current and voltage rating as required to recharge said storage capacitor after each discharge before next discharge,

high voltage ignition coil primary winding energizing current means and means for abruptly interrupting said energizing current at the instant an initial spark is to be struck,

circuit means for connecting said high voltage secondary winding to said spark plug in parallel connection with said high current source through a second rectifier, said first and second rectifiers providing separation between said high voltage secondary winding and said high current power source,

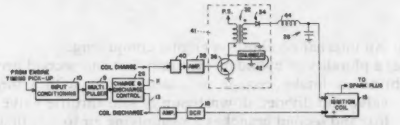
circuit means providing a common ground return path for said high voltage ignition coil, said high current power source and said spark plugs.

4,345,576

MULTI-SPARK CD IGNITION

Gordon P. Moseley, and Kurt W. Christner, both of Carson City, Nev., assignors to Super Shops, Inc., Newport Beach, Calif.

Filed Sep. 24, 1979, Ser. No. 77,928
Int. Cl.³ F02P *3/06*
U.S. Cl. 123—604 **22 Claims**



1. A multi-spark ignition for an internal combustion engine; said engine comprising a combustion chamber having a spark plug therein, an ignition coil for producing electrical energy to cause said spark plug to spark, means to supply said energy to said plug, means for producing timing pulses from said engine, each said timing pulse having a time duration proportional to the speed of said engine; said ignition comprising means to produce multiple pulses corresponding to multi-sparks at said plug, and means to cause said pulse producing means to output said pulses for a period of time which is the shorter of said time duration of each said timing pulse or a predetermined period of time about equal to the maximum time required for complete combustion in said chamber during slow engine speed operation as in cranking or idle.

4,345,577

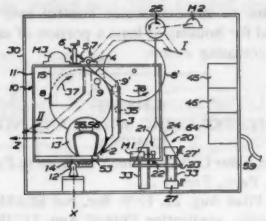
SPRING TYPE APPARATUS FOR PROJECTING BALLS

Uno K. T. Andersson, Ullstorp P.B. 3287, Vinslöv, Sweden (S-280-13)

PCT No. PCT/SE79/00040, § 371 Date Oct. 27, 1979, § 102(e) Date Sep. 28, 1979, PCT Pub. No. WO79/00665, PCT Pub. Date Sep. 6, 1979
PCT Filed Feb. 26, 1979, Ser. No. 169,115
Claims priority, application Sweden, Feb. 27, 1978, 7802182
Int. Cl.³ F41B *7/00*
U.S. Cl. 124—16 **10 Claims**

1. Apparatus for projecting balls, including a frame an impact device **(10)** supported in said frame **(11)** and provided with means to convey to a ball to a location on the frame for projection, the frame **(11)** being supported in a frame-work **(30)** for movement around a vertical axis (X) and a horizontal axis (Y), a first drive means (M1) is provided to rotate the frame **(11)** around said vertical axis (X) in two different horizontal directions in horizontal plane, a second drive means (M2) rotates said frame **(11)** around said horizontal axis (Y) in two different vertical directions, an underlying support **(23)** aids in rotation of the frame about the horizontal and vertical axes, the first and the second drive means (M1, M2) rotate the frame over an adjustable angular arc, there being provided limit means **(27, 27'** and **28, 28')** are for limiting the movement of the

frame (11) around the vertical axis (X) and the horizontal axis (Y) to mark the end positions for the impact device (10), said limit means being coupled to a respective drive means (M1, M2) and upon actuation is adopted to cause the frame to reverse its direction of movement and said limit means are displaceably supported for variation of the angular arcs in horizontal and vertical direction over which the frame is moveable.



4,345,578

BALL PROJECTING DEVICE CAPABLE OF PROVIDING SPIN

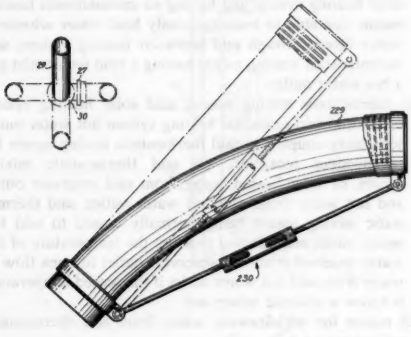
Richard A. Speer, Ware Neck, Va., assignor to Apollo Systems, Inc., Cedar Falls, Iowa

Continuation-in-part of Ser. No. 929,675, Jul. 31, 1978, Pat. No. 4,250,862, which is a continuation-in-part of Ser. No. 894,162, Apr. 5, 1978, Pat. No. 4,212,284, which is a continuation-in-part of Ser. No. 764,197, Jan. 31, 1977, Pat. No. 4,094,294. This application May 25, 1979, Ser. No. 42,499

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.³ F41F *1/04*

U.S. Cl. 124—56 **14 Claims**



1. A device for projecting a ball, the device comprising a ball-directing tube having an internal circumference for confining and directing a ball to be projected, at least the outermost portion of the tube extending out to the muzzle being curved along the longitudinal extent thereof, said tube defining a midline along said longitudinal extent which is curved along a substantial portion of the tube's length, said midline having a radius of curvature no larger than 125 times the internal radius of the tube; gas pressure supply means in fluid flow connection with the tube to provide gas under pressure thereto; a first end to the tube being in fluid pressure connection to the pressure supply means; means for feeding a ball into the tube at the breech end thereof for movement along the tube in a direction from the first end of the tube toward the muzzle end of the tube and means for transiently developing gas pressure within the tube between the first end and the ball within the tube; the ball feeding means being capable of feeding a ball slightly smaller than the internal diameter of the curved portion of the tube; whereby a ball projected from the tube has a rotational velocity imparted thereto.

4,345,579

CUTTING WHEEL

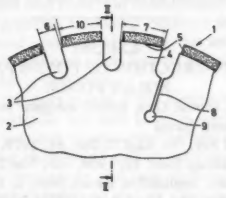
Rolf Eichenlaub, Quellenweg 26, D-5900 Siegen-Volnsberg, and Boris Z. Novakovic, Am Homberg 28, D-5931 Netphen-Frohnhausen, both of Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,746

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 8017100[U]

Int. Cl.³ B28D *1/04*

U.S. Cl. 125—15 **5 Claims**



1. In a cutting disk comprising a steel support disk having radially extending slots spaced about its periphery, the slots defining between them bases, and cutting segments of abrasive material mounted on said bases; the improvement in which the disk is a dry cutting disk, and thermal expansion equalizing slots spaced equidistantly about the disk circumference and extending radially inwardly further than the first-mentioned slots and being narrower than said first-mentioned slots, the last-mentioned slots being arranged as radially inward extensions of the first-mentioned slots.

4,345,580

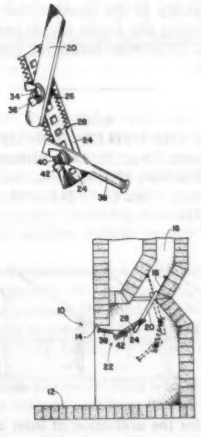
FIREPLACE DAMPER ATTACHMENT

Gerald W. Speicher, P.O. Box XX, Santa Rosa, Calif. 95403

Filed Nov. 10, 1980, Ser. No. 205,671

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—288 **2 Claims**



1. An attachment for a fireplace flue damper having a handle of flat bar stock metal with a first hole therethrough, said handle being disposed to swing through the fore and aft plane

of a face thereof to adjust said damper; said attachment comprising:

a rectangular elongated channel defined by opposite side walls and a web joining said side walls adapted to be disposed across a face of said damper handle at a selected angle along said plane, with the edges of said side walls in engagement therewith;

a plurality of square adjustment holes along the web of said channel;

a carriage bolt nested in and extending through a selected one of said adjustment holes and said first hole so that the end of said channel is disposed at a desired height in the fireplace opening when the damper is in open position;

a force-applying wing nut threaded onto said carriage bolt said side wall edges being serrated to grip said flat bar handle at any location thereof when force is applied thereto and

a hand grip secured to the other end of said channel.

4,345,581

BOTTOM CONSTRUCTION OF PONDS PARTICULARLY SOLAR PONDS

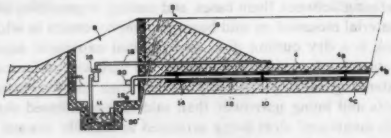
Sraya Shacher, Ramat Gan, Israel, assignor to Solmat Systems Ltd., Jerusalem, Israel

Continuation of Ser. No. 62,477, Jul. 31, 1979, abandoned. This application Dec. 19, 1980, Ser. No. 218,596

Claims priority, application Israel, Nov. 1, 1978, 55479

Int. Cl.³ F24J *3/02*; E02D *27/00*

U.S. Cl. 126—415 **10 Claims**



1. A pond containing a body of liquid, characterized in that, in order to minimize seepage of the liquid through the pond bottom, the pond comprises a multi-layer bottom construction over the natural earth and underlying the complete pond, which bottom construction includes an upper layer of a permeable material having a low degree of permeability to the liquid in the pond, an intermediate layer of a permeable material having a high degree of permeability to the liquid in the pond, and a bottom layer of a permeable material having a low degree of permeability to the liquid in the pond; and pumping means for returning the liquid which permeates through the upper layer into the intermediate layer, back to the pond above the upper layer.

4,345,582

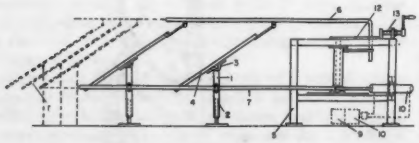
SYSTEM FOR THE UTILIZATION OF SOLAR ENERGY

Naaman B. Aharon, Drori St. 14A, Rishon Litzion, Israel

Filed Nov. 19, 1979, Ser. No. 95,646

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—424 **14 Claims**



1. A system for the utilization of solar energy comprising a plurality of units operating together, each of said units comprising a solar collector mounted on a stand carrying said solar collector, horizontal rotation means connected to each unit for rotating a respective solar collector around the horizontal axis and vertical rotation means for rotating each stand and its respective solar collector around the vertical axis, horizontal and vertical actuation means for actuation of the horizontal and vertical rotation means, tracking means for tracking the control of said actuation means, said actuation means including a central control post connected to said horizontal and vertical rotation means to simultaneously control said units, and a separate stand for housing at least a portion of said horizontal and vertical actuating means.

4,345,583

WATER HEATER USING SOLAR AND NON-SOLAR ENERGY

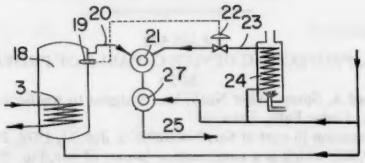
Claude Morin, Saint Lattier, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

Filed Aug. 21, 1979, Ser. No. 68,453

Claims priority, application France, Aug. 21, 1978, 78 24848

Int. Cl.³ F24J *3/02*; G05D *23/00*

U.S. Cl. 126—427 **10 Claims**



1. Apparatus for the preparation of hot water comprising:

(a) a solar heating system including a reservoir for water, said reservoir having a cold water inlet and a solar heated water outlet, and a solar heating means for heating water in said reservoir;

(b) an auxiliary non-solar heating system independent of said solar heating system and having an instantaneous heating means operable to instantaneously heat water whenever water flows through said non-solar heating system, said instantaneous heating means having a cold water inlet and a hot water outlet;

(c) thermostatic mixing means, said solar heating system outlet and said non-solar heating system hot water outlet separately coupled to said thermostatic mixing means for independent reception, by said thermostatic mixing means, of solar heated water from said reservoir outlet and hot water from said hot water outlet, said thermostatic mixing means being normally closed to said hot water outlet and adapted to sense the temperature of the water received from said reservoir outlet to open flow of water from said hot water outlet if the sensed temperature is below a selected value; and

(d) means for withdrawing water from said thermostatic mixing means.

4,345,584

SOLAR ENERGY SYSTEM

George R. Royer, 2137 Ragan Woods Dr., Toledo, Ohio 43614

Filed Jan. 4, 1980, Ser. No. 109,558

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—427 **3 Claims**

1. A solar heating apparatus comprising:

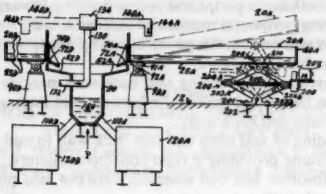
(a) a longitudinally disposed solar heating collecting surface, disposed towards the sun, with an upper surface above and on undersurfaces thereunder;

(b) retaining means on the upper surface of said collecting surface to retain water on the upper surface of said collecting surface for the purpose of solar heating of said retained water;

(c) elevating means appended to one portion of the collect-

ing surface, for elevation of that portion of the solar heating surface for facilitating drainage of solar heated water;

(d) pivot means integrally appended to that portion of collecting surface which is longitudinally opposite to the end having the elevating means; whereby the collecting surface when elevated by said elevating means elevates the collecting surface in a tilted position about said pivot



means, and downwardly towards said end where the pivot means is located;

(e) exit means in said retaining means on said surface to allow drainage of the water off the collecting surface;

(f) collecting means adjacent said exit means to collect solar heated water;

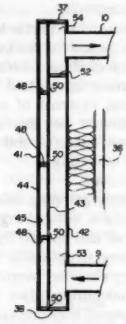
(g) superheating means to superheat said solar heated water.

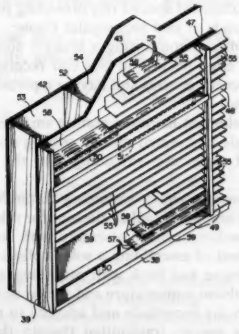
4,345,585

SOLAR HEATING APPARATUS

Victor C. Ellis, La Ronge, Canada, assignor to Sun-Woods Engineering Ltd., Saskatchewan, Canada

Filed Jul. 9, 1980, Ser. No. 167,217
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 **2 Claims**





1. A solar heat collector for use in a solar heating apparatus of the type which utilizes air as a heat transfer medium comprising:

(a) a rectangular casing, including:

(i) a front wall,

(ii) a rear wall,

(iii) a pair of opposing side walls,

(iv) a top wall, and

(v) a bottom wall,

the front wall being adapted to transmit solar heat to the interior of the casing;

(b) an intermediate wall extending between the side walls;

(c) first partitions interconnecting said front wall and said intermediate wall, said first partitions extending vertically between the top and bottom walls of the casing, and horizontally between the opposing side walls of the casing to define a plurality of rectangular heating chambers in the area between said front and intermediate walls;

(d) second partitions extending between said intermediate wall and said rear wall dividing the area between said intermediate and rear walls into an air inlet manifold and an air discharge manifold;

(e) cold air inlet duct means in the bottom of said rear wall for introducing air into said air inlet manifold;

(f) air inlet openings in said intermediate wall connecting each heating chamber to said air inlet manifold;

(g) air outlet openings in said intermediate wall connecting each heating chamber to said air discharge manifold;

(h) a plurality of heat exchange fins in said heating chambers for receiving solar heat and transferring such heat to air passing from the air inlet opening to the air outlet opening in each heating chamber; and

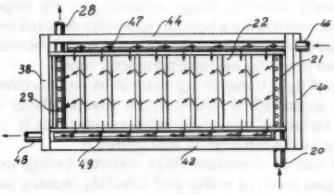
(i) hot air outlet duct means in the top of said rear wall for discharging hot air from said air discharge manifold.

4,345,586

CASCADE SOLAR HEATER

Julio A. Monjes, 2858 Via Cordoba, San Roman, Calif. 94583

Filed Feb. 5, 1980, Ser. No. 118,738
Int. Cl.³ F24J 3/02
U.S. Cl. 126—449 **5 Claims**



1. A cascade solar fluid heater which can be mounted on a roof or other structure for direct solar energy heating of a fluid by means of incident radiant energy, comprising:

a plurality of collection channels connected in series to form a continuous cascade or staircase arrangement, the channels being of a highly absorbing material which absorbs a fraction of the incident radiant energy and increases in temperature;

first inlet means for introducing a first fluid at the top of the cascade arrangement to produce a continuous flow of fluid down the cascade, the fluid flow being sufficient for causing the fluid to collect in the collection channels for a sufficient time to be heated by the material forming the channels;

first removal means to remove fluid which has flowed to the bottom of the cascade and been heated in the collection channels;

a backing plate to which the continuous cascade of collection channels is mounted, the backing plate and channels forming a series of enclosed flow spaces underneath the channels running perpendicular to the cascade flow;

second inlet means for introducing a second fluid into the enclosed flow spaces underneath the channels to produce an independent cross-flow of the second fluid underneath the channels to be heated by the material forming the channels; and

second removal means to remove fluid which has flowed through the enclosed flow spaces beneath the channels and been heated.

4,345,587

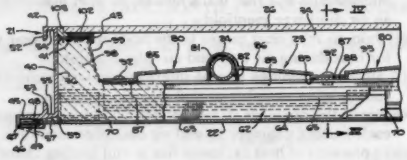
SOLAR ENERGY COLLECTOR MEANS AND METHOD OF ASSEMBLING THE SAME

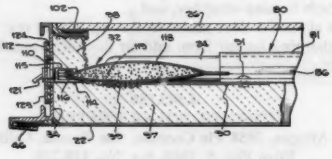
Elmer R. Carvalho, Claremont, Calif., assignor to D G Shelter Products Company, City of Industry, Calif.

Filed Nov. 16, 1979, Ser. No. 95,623

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **15 Claims**





1. In a solar collector, the improvement comprising:

an extruded aluminum rectangular frame having a peripheral inwardly directed flange adjacent the top edge of the frame, and having a bottom outwardly directed peripheral flange provided with a return portion therebeneath defining an inwardly opening peripheral recess;

a plate of light transmitting material having peripheral margins supported by said inwardly directed flange with the top surface of the place lying in substantially the same plane as the top edge of said frame;

a backwall of aluminum sheet material having peripheral margins received within said inwardly opening peripheral recess of said bottom flange;

an adhesive structural bonding material between peripheral edges of said plate and the top of said frame and inwardly directed flange for bonding and structurally securing said plate to the frame;

an adhesive structural bonding material between the peripheral upper surface of said backwall margins and the bottom surface of said bottom flange and structurally joining said frame and said backwall margins;

said return portion on said bottom flange below said said backwall margins being adapted for crimping engagement with said backwall margins;

said structural peripheral bonding of said plate and said backwall to said rectangular frame providing a rigid box-like collector stress-skin structure.

2. In a solar collector, the improvement comprising:

an extruded aluminum rectangular frame having a peripheral inwardly directed flange adjacent the top edge of the frame;

a plate of light transmitting material having peripheral margins supported by said flange with the top surface of the plate lying in substantially the same plane as the top edge of said frame; and

an adhesive sealant material between the peripheral edges of said plate and the top of said frame for bonding and securing the plate to the frame;

a back wall of aluminum sheet material;

said rectangular frame having a bottom outwardly directed peripheral flange provided with a return portion therebeneath defining a peripheral recess opening inwardly and receiving peripheral margins of said back wall;

means on said bottom flange for crimping engagement with said back wall margins;

an adhesive sealant bonding said back wall margins to said bottom flange and sealing the bottom joint lines made by said frame and back wall;

said bonding of said plate and said back wall to said rectangular frame providing a rigid collector structure;

a solar absorber and coil assembly between said plate and said back wall;

and means to position and retain said coil assembly within said frame;

said means for positioning and retaining said coil assembly in said frame including

a plurality of generally U-shaped cross rib means secured to said frame and bonded to said back wall;

a plurality of generally U-shaped cross members on said coil assembly;

said cross members having clip engagement means depending therefrom;

and a plurality of spaced clip members positioned within said U-shaped cross rib means whereby said coil assembly is adapted to be snapped into assembled relation with said frame and back wall.

9. In a solar collector having a receptacle, a solar absorber means therewithin, and a light transmitting plate thereon; the provision of:

an opening in said receptacle;

a removable desiccant means received within said opening and provided with means for sealing said opening;

said desiccant means including a breather tube having one end in desiccant material in said desiccant means and having its other end external of said receptacle for air communication between the interior of said receptacle through the desiccant material and the ambient air;

said desiccant means including

a porous bag of desiccant;

and means for releasably gripping said bag.

11. In a collector means comprising a rectangular frame provided with a backwall and spaced light transmitting plate, both wall and plate being structurally bonded and sealed to said frame, a solar energy absorber means located between said backwall and light transmitting plate within said frame, a blanket of insulating material between said absorber means and said backwall including, the combination of:

attachment means on said rectangular frame comprising external juxtaposed spaced ribs providing parallel recesses at least at ends of said rectangular frame;

and bracket means comprising a bracket element having a depending edge portion at one end receivable in one of said juxtaposed recesses and having a pivotal mounting at its other end

said bracket element having a seating surface,

a bracket angle clip seated on said seating surface with one leg of said angle clip extending into the other of said recesses,

and a securement member extending through the other leg of said clip and said bracket element for releasably retaining said bracket means in assembly with said frame.

13. In a method of assembling a solar collector for thermal isolation of a frame and back wall providing a receptacle in contact with ambient temperature and a solar absorber and coil assembly within the receptacle and adapted to receive and be heated by solar energy transmitted thereto through a light transmitting plate, the steps of:

positioning and securing nonmetallic, insulating clip members in said receptacle;
providing clip engagement means on said coil assembly;
interposing a blanket of insulating material between said coil assembly and the interior of said receptacle including said insulating clip members;
placing said coil assembly over said blanket of insulating material;
and pressing said coil assembly toward said receptacle to cause engagement of said clip engagement means and clip members with said insulating blanket therebetween.

4,345,588

METHOD OF DELIVERING A THERAPEUTIC AGENT TO A TARGET CAPILLARY BED

Kenneth J. Widder, Carboro, N.C., and Andrew E. Senyei, Long Beach, Calif., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 32,399, Apr. 23, 1979, and Ser. No. 859,842, Dec. 12, 1977, said Ser. No. 32,399, is a continuation-in-part of Ser. No. 820,812, Aug. 1, 1977, abandoned. This application Jun. 27, 1980, Ser. No. 163,716

Int. Cl.³ A61K *9/50, 9/38*

U.S. Cl. 128—1.3 **12 Claims**

1. The method of delivering a therapeutic agent to a target site associated with a capillary bed of the body, comprising the steps of:
(a) incorporating the therapeutic agent in microspheres formed from a biodegradable matrix material with magnetic particles embedded therein, said magnetic particles having an average size of not over 300 Angstroms, said microspheres having an average size of less than 1.5 microns and passing into said capillary bed with the blood flowing therethrough;
(b) introducing said therapeutic agent-containing microspheres into an artery upstream of said capillary bed;
(c) applying a magnetic field to the area of the body of said capillary bed and artery, said magnetic field being of a strength capable of immobilizing said microspheres at the blood flow rate of said capillary bed while permitting said microspheres to pass through said artery at the blood flow rate therein;
(d) immobilizing at least part of said microspheres in capillaries of said target bed by said magnetic field application while blood continues to perfuse therethrough; and
(e) removing said magnetic field before said therapeutic agent is released, said microspheres being retained in said capillary bed after said removal of said magnetic field for release of said therapeutic agent in effective therapeutic relation to said target site.

4,345,589

ENDOSCOPIC INSTRUMENTATION APPARATUS

Siegfried Hiltebrandt, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 148,755

Claims priority, application Fed. Rep. of Germany, May 15, 1979, 7913986[U]

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **1 Claim**

1. Endoscopic instrumentation apparatus for performing laparoscopy and culdoscopy, comprising:
(a) a puncture cannula presenting a connection for a gas supply having a distal oblique face and a proximal cylindrical casing in which a coupling element constituted by a hollow shaft is installed for displacement against a spring toward the proximal end,
(b) a hollow mandrel presenting a connection for a gas supply and a related optical system, each of which is respectively and separately connectible to said coupling element of said puncture cannula and when so connected each extending distally beyond said oblique face of said puncture cannula,
(c) a hollow contractible cylindrical intermediate element comprising contractible parts reducible in length against a spring therein and also connectible to said coupling element of said puncture cannula, said interemediate element being combined with and traversable by an optical system longer than the first when connected therewith and of a length to project distally at least beyond said oblique face of said puncture cannula,
(d) the contractible length of the intermediate element resulting in the distal end of the longer optical system therein projecting further beyond the oblique face of the cannula by the length of the contraction so the distal end of the second-named optics may be brought that much closer to the object,
(e) wherein said intermediate element comprises a first hollow cylinder closed off at its distal end by a coupling element complementally engaging in said coupling element of said puncture cannula, a second hollow cylinder closed off at its proximal end and being displaceable in said first hollow cylinder toward the distal end against a spring by means of handles, and wherein a proximal delimitation of said second displaceable, hollow cylinder is provided with a coupling element similar to that of said hollow shaft of said puncture cannula.

4,345,590

SUPPORT BANDAGE

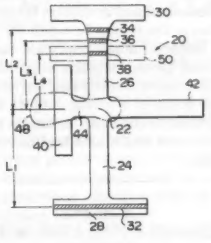
Kikuo Nakajima, Kosai, Japan, assignor to Kuniaki Yamazaki, Chiba, Japan

PCT No. PCT/JP80/00026, § 371 Date Oct. 26, 1980, § 102(e) Date Oct. 23, 1980, PCT Pub. No. WO80/01758, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 26, 1980, Ser. No. 201,406

Int. Cl.³ A61F *13/06*

U.S. Cl. 128—166 **10 Claims**



1. A support bandage formed of a continuous and thin sheet material with one surface thereof being applied thereto with an adhesive, comprising:
(a) a foot sole attachable portion;
(b) a first extended portion to be closely attached to the inner side of the body, which is radially extended from said foot sole attachable portion and the forward end of which is larger in width than the base portion;
(c) a second extended portion to be closely attached to the outer side of the body, which is radially extended from said foot sole attachable portion and the forward end of which is larger in width than the base portion; and
(d) a third extended portion to be closely attached to the rear side of the leg, which is radially extended from said foot sole attachable portion which is interposed between said first and second extended portions; whereby said extended

portions are adhered to the ankle and therearound, overlapped one another to cover the ankle and thereabout and prevent the rotation of the ankle to an extreme extent.

4,345,591

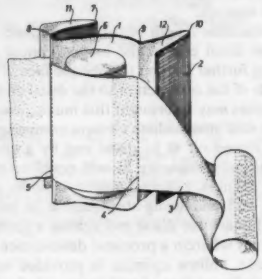
MOUND DRESSING

Erland Hedgren, Täby, Sweden, assignor to Salve S.A., Switzerland

Continuation of Ser. No. 940,087, Sep. 6, 1978, abandoned. This application Feb. 27, 1981, Ser. No. 239,141

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—169 **2 Claims**



1. A wound dressing comprising an elongated rolled bandage having longitudinal edges and an elongated sheet compress laid lengthwise one overlying the other, said compress having a width larger than the width of the bandage and being stitched to the bandage forming two spaced seams extending transversely across the width of the bandage, the length of bandage between said two spaced seams being greater than the length of the compress between said two spaced seams to define a normally open pocket between the bandage and the compress which is open along the respective longitudinal edges for the removable insertion of an additional bandage means therebetween, said compress having a pair of flaps respectively extending freely beyond said two spaced seams to enable the compress to have one of two predetermined conditions, the first predetermined condition being one in which said flaps are folded over the region between the two spaced seams and the second predetermined condition being one in which said flaps are spread along a substantial portion of the length of the bandage, said compress being adapted to be applied against a wound on the body of a living subject and said bandage, adapted to be applied to the body, acting to pull the portion of said compress between said seams taut thereby applying pressure to said wound.

4,345,592

PRESSURE DEMAND REGULATOR WITH AUTOMATIC SHUT-OFF

Eugene A. Giorgini, Cheektowaga, N.Y., and John L. Sullivan, Fort Erie, Canada, assignors to A-T-O Inc., Willoughby, Ohio

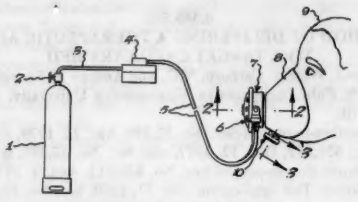
Filed Sep. 10, 1980, Ser. No. 185,894

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—204.26 **7 Claims**

1. In a pressure-demand breathing apparatus including a face mask providing a mask chamber when fitted against the face of a user, and means including an air supply line for connecting said mask to a pressurized air supply, a pressure demand regulator positioned in said air supply line between said face mask and said air supply,

said pressure-demand regulator including means responsive to pressure within said mask chamber for admitting said pressurized air to said mask chamber at flow rates required for normal breathing or abnormally deep breathing when said mask is worn and for maintaining a predetermined positive pressure in the mask chamber above ambient pressure when said mask is fitted against the face of a user, said regulator also admitting said pressurized air to said mask at a predetermined high air flow rate substantially greater than that required either for normal breathing or for abnormally deep breathing when said mask is removed the improvement comprising shut off means for interrupting air flow from said air supply to said mask chamber and time delay means for preventing said shut-off means from interrupting said air flow for a predetermined period of time, wherein said shut-off means is responsive to said air flow and time delay means to interrupt the supply of air to said mask automatically upon



sustained high flow through said regulator at a rate exceeding that required even for abnormally deep breathing which occurs for a time exceeding said predetermined period of time, whereby, said shut off means differentiates between temporary, user-induced high flow rates only momentarily exceeding that required even for abnormally deep breathing and sustained high flow rates exceeding said preselected values, such as occur when said mask is removed from the face of a user and open to ambient atmosphere, said shut-off means operating to interrupt the air supply only in the event of such sustained high flow rates.

4,345,593

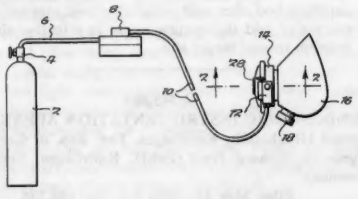
PRESSURE-DEMAND BREATHING APPARATUS WITH AUTOMATIC AIR SHUT-OFF

John L. Sullivan, Fort Erie, Canada, assignor to A-T-O Inc., Willoughby, Ohio

Continuation of Ser. No. 926,004, Jul. 19, 1978, abandoned. This application Feb. 6, 1981, Ser. No. 231,994

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—204.26 **7 Claims**



1. In a pressure-demand breathing apparatus including a face mask providing a mask chamber when fitted against the face of a wearer and means including an air supply line for connecting said mask to a pressurized air supply, a pressure demand regulator positioned in said air supply line between said face mask and said air supply,

said pressure-demand regulator including means responsive to pressure within said mask chamber for admitting said pressurized air to said mask chamber at flow rates required for normal breathing or abnormally deep breathing when said mask is worn and for maintaining a predetermined positive pressure in the mask chamber above the ambient pressure when said mask is worn, said regulator also admitting said pressurized air to said mask at a predetermined high air flow rate substantially greater than that required either for normal breathing or for abnormally

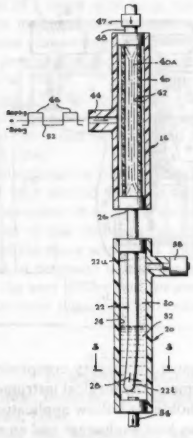
deep breathing when said mask is removed, the improvement comprising shut-off means positioned between said pressure-demand regulator and said air supply, said shut-off means being responsive to said predetermined high air flow rate through said pressure demand regulator which exceeds that required even for abnormally deep breathing for automatically interrupting the supply of air to said mask under unrestricted flow conditions such as occurs when the mask is removed from the face of a wearer and is open to the ambient atmosphere, whereby said shut-off means is inoperative during normal breathing and during abnormally deep breathing when the mask is worn but only becomes operative when the flow therethrough exceeds the flow which occurs during abnormally deep breathing so that sufficient air is supplied to the wearer at all times when said mask is worn but the air supply is shut off when said mask is removed, to thereby prevent unwanted depletion of said air supply.

4,345,594

CLOSELY CONTROLLABLE INTRAVENOUS INJECTION SYSTEM

Jose Bisera, Camarillo, and Max H. Weil, Beverly Hills, both of Calif., assignors to Institute of Critical Care Medicine, Los Angeles, Calif.

Filed Sep. 12, 1980, Ser. No. 186,681
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 F **4 Claims**



1. Apparatus for transferring a fluid from a container to a patient-connected catheter, in a controlled and primarily steady flow, comprising:

a peristaltic pump having an inlet connectable to said container and a pump outlet; and

a pressure moderator having an inlet coupled to said pump outlet and having a moderator outlet connectable to said patient-connected catheter;

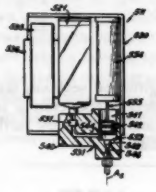
said moderator including walls forming a closed chamber connected to said outlet, and containing a quantity of said fluid and a gas, said chamber having a lower end connectable to said catheter, so that the fluid flowing to the patient passes first through said chamber and forms a fluid column of variable height therein, and including a flexible tube having an open end coupled to said pump outlet and a closed end said tube including a portion lying with said chamber and having at least one slit therein to permit the release of fluid into said chamber at each pulse of said peristaltic pump.

4,345,595

PIEZOELECTRIC FLUID INJECTOR

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, Continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, and Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,235. This application Mar. 27, 1981, Ser. No. 248,566
Int. Cl.³ A61M *5/20*
U.S. Cl. 128—214 F **1 Claim**



1. Apparatus for injecting fluid into a patient at an average prescribed rate over a prolonged period of time comprising:

carriage means defining a fluid chamber therein carrying fluid to be dispensed and an outlet from said fluid chamber connected to the patient;

a piston slidably mounted in said fluid chamber for forcing fluid from said outlet as said piston is moved toward said outlet;

an electrical power supply;

electrically operated driving means for moving said piston toward said outlet when said electrically operated driving means is connected to said power supply, said electrically operated driving means constructed and arranged to move said piston only a prescribed distance toward said outlet each time said electrical power supply is connected to said electrically operated driving means regardless of the length of time said electrical power supply is connected to said electrically operated driving means, said piston forcing a volume of the fluid from said outlet much less than the total volume of fluid to be injected over the prolonged period of time each time said piston is moved said prescribed distance; and

control means for selectively connecting said electrical power supply to and disconnecting said electrical power supply from said electrically operated driving means at a rate such that fluid is injected into the patient at the desired average rate over the prolonged period of time so that, if said control means fails so as to continuously connect said electrical power supply to said electrically operated driving means, said piston will be moved only said incremental prescribed distance toward said outlet to prevent overdosing the patient,

said driving means including a driving member exhibiting a piezoelectric effect and linkage means connecting said driving member to said piston so that the change in volume experienced by said driving member when said control means connects said power supply to said driving member moves said piston toward said outlet.

4,345,596

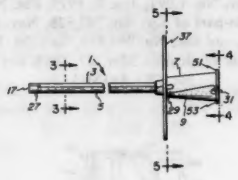
ARTERIAL CATHERIZATION DEVICE

Ruperto S. Young, Amsterdam, N.Y., assignor to Janis Marie Young, Amsterdam and Roberta H. Wessendorf, Guilderland, both of, N.Y.

Filed Dec. 23, 1981, Ser. No. 333,704
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 R **21 Claims**

1. A surgical instrument for insertion into a blood-vessel lumen, said surgical instrument comprising a separable assembly of longitudinal sections in mating relationship, said longitu-

dinal sections having first cooperating releasable interdigitation locking means for maintaining said longitudinal sections in their assembled relationship and releasable upon relative



movement of said longitudinal sections, said longitudinal sections having second means cooperating to force apart and separate said longitudinal sections by further relative movement of said longitudinal sections.

4,345,597

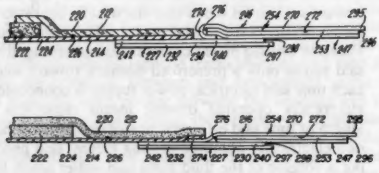
DIAPER WITH RESEALABLE TAPE CLOSURE

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson Baby Product Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 782,650, Feb. 27, 1976, abandoned, which is a division of Ser. No. 661,920, Feb. 27, 1976, Pat. No. 4,049,001. This application Dec. 12, 1979, Ser. No. 102,703

Int. Cl.³ A61F *13/16*

U.S. Cl. 128—287 **3 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a first securing tape ribbon having a fixed end and a free working end,

an adhesive coating on at least one face of said fixed end of said first securing tape ribbon by means of which said fixed end of said first securing tape ribbon is attached to said diaper outside surface at a marginal location thereof, and a pressure-sensitive adhesive coating on said one face of said free working end of said first securing tape ribbon;

a second securing tape ribbon having a fixed end and a grippable free working end, said fixed end of said second securing tape ribbon being coextensive with and adhesively but releasably attached to said adhesive-coated face of said free working end of said first securing tape ribbon and the free working end of said second securing tape ribbon extending beyond the free working end of said first securing tape ribbon, and a pressure-sensitive adhesive coating on said second securing ribbon on the face thereof opposite to the face attached to said free working end of said first securing tape ribbon;

release means for engagement with said pressure-sensitive adhesive coating on said second securing tape ribbon, comprising a cover strip releasably attached to said adhesive coating on said second securing tape ribbon which is removable therefrom to make said pressure-sensitive adhesive coating on said second securing tape ribbon available for use in securing said diaper about an infant, said cover strip having a length greater than said adhesive coating on said second securing tape ribbon and including a projecting portion which extends beyond the innermost edge of said adhesive coating on said second securing tape ribbon and is attached to the adhesive coating on said free working end of said first securing tape ribbon; said free working end of said first securing tape ribbon being separable from said fixed end of said second securing tape ribbon to enable said diaper to be removed from said infant and to make said pressure-sensitive adhesive coating on said free working end of said first securing tape ribbon available for use in refastening said diaper about said infant.

4,345,598

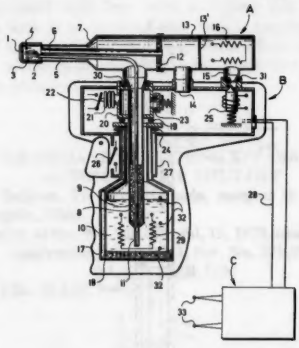
CRYOGENIC APPARATUS FOR SURGERY

Ladislav Zobac, Brno; Zdenek Malek, Prague; Frantisek Soukup, Roztoky U Praha; Antonin Ryska, Prague; Jan Jelinek, Prague, and Jiri Busta, Prague, all of Czechoslovakia, assignors to Vyzkumny ustav Silnoproude Elektrotechniky, Prague, Czechoslovakia

Filed Mar. 27, 1980, Ser. No. 134,415

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **3 Claims**

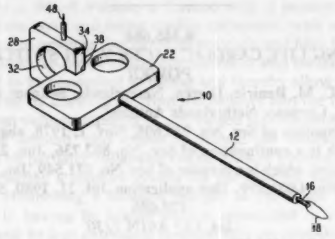


1. Cryogenic apparatus for surgery comprising a hand-held mobile surgical instrument, the surgical instrument comprising an elongated hollow holder, a hollow applicator on a first end of the holder, a porous heat exchanger and an electrical heating unit disposed within the applicator, a heating device for gases escaping from the applicator disposed near the second end of the holder, a mounting member for the holder, said mounting member generally of T-shape and having a head portion in the form of an elongated generally horizontal hollow part upon which the holder is mounted and a handle portion disposed generally vertically, means for exchangeably mechanically and electrically connecting the head of the mounting member to the holder, a storage vessel for liquefied gas disposed within the handle portion of the mounting member remote from the holder, conduit means leading from storage vessel in the handle portion of the mounting means to the applicator in the holder, and a pressurizing switch with a pressure indicator and an electro-magnetic regulating valve disposed within the mounting member, the holder having an extension remote from the applicator thereon, the electro-magnetic regulating valve being seated air tightly on said head portion of the mounting member, said porous heat exchanger being composed of a pile of metal grids situated in planes perpendicular to the axis of the applicator.

4,345,599
TONSIL SNARE

Stuart G. McCarrell, 2204 N. Cleveland St., Chicago, Ill. 60614

Filed Mar. 20, 1980, Ser. No. 132,127
Int. Cl.³ A61B *17/00, 17/36, 1/72*
U.S. Cl. 128—320 13 Claims



1. A snare instrument comprising: an elongate tube including a forward end and a rear end; finger means mounted at said rear end of said tube, said

finger means comprising a first plate having a rear edge, first and second hole means defining respective first and second holes through said plate on opposite sides of said tube for receiving first and second fingers of the user, and notch means defining a notch in said rear edge;

an elongate rod mounted in said tube for axial and rotary movement, said rod including a forward end adapted for attachment of a snare wire loop, and a rear end; and

thumb means mounted on said rear end of said rod, said thumb means comprising a second plate having a forward edge, said second plate having a hole therein for receiving the thumb of a user,

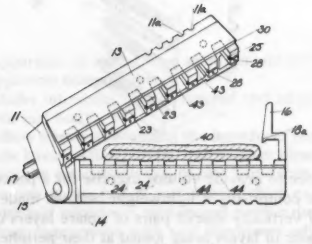
said rod having a predetermined length such that when said forward edge of said second plate engages said rear edge of said first plate said forward end of said rod is located within said tube,

wherein relative rotation of said plates permits receipt of a portion of said second plate in said notch and permits forward movement of said first end of said rod out of said forward end of said elongate tube for attachment or detachment of the snare wire loop, and rearward movement of said rod in response to the parting of the thumb and fingers of the user causes said forward end of said tube to receive the snare wire loop and collapse the same.

4,345,600
PURSE-STRINGER

Robert G. Rothfuss, Bellevue, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 4, 1980, Ser. No. 174,813
Int. Cl.³ A61B *17/04*
U.S. Cl. 128—334 R 12 Claims

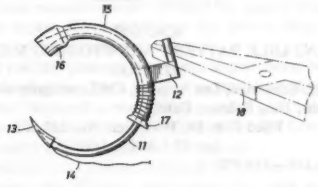


1. An instrument to facilitate the emplacement of a purse-string suture in a tubular structure, comprising a barrette-like structure having upper and lower jaws hinged together at one end, said jaws having longitudinally spaced clamping teeth with each of the teeth on said upper jaw being directly opposed to a corresponding tooth on said lower jaw whereby when a tubular structure is clamped between said jaws, the portions thereof between the pairs of opposing clamping teeth bulge out into the spaces between the teeth, a needle track extending longitudinally in each of said jaws disposed respectively above and below the clamping line of said teeth, whereby a needle and suture, in passing through the track of one of said jaws passes the suture through the portions of said tubular structure bulging into the spaces between the teeth on said one of said jaws, and in passing back through the track on the other of said jaws passes the suture through the portions of said tubular structure bulging into the spaces between the teeth on said other jaw, the tracks in the respective jaws communicating with each other, so that, when said jaws are unlatched and opened, said tubular structure, with the purse-string suture in place, may be removed from the instrument.

4,345,601
CONTINUOUS SUTURING DEVICE

Mamoru Fukuda, 1260 Hardy, Bridge City, Tex. 77611

Filed Apr. 7, 1980, Ser. No. 138,232
Int. Cl.³ A61B *17/06, 17/04*
U.S. Cl. 128—339 15 Claims



1. A suturing apparatus for continuous suturing of incised or ruptured tissue comprising:

(a) a curved, elongate, axially hollow sleeve having first and second ends and defining an elongate slot;

(b) a curved suturing needle with a point, said suturing needle having a common arc and radii of curvature with said hollow sleeve and being movable relative to said sleeve between a retracted position where said needle is substantially positioned within said hollow sleeve and an extended position where said needle extends from within said first end of said sleeve into said second end of said sleeve;

(c) a needle appendage extending from adjacent the unpointed end of said needle and through said elongate slot and defining a needle manipulating lever means located externally of said elongate sleeve;

(d) a thread bearing cap for said point of said suturing needle adapted to connect to a suture thread; and

(e) means for selectively separating said cap from said suturing needle point.

4,345,602
MEDICAL VASCULAR GUIDE WIRE AND SELF-GUILDING TYPE CATHETER

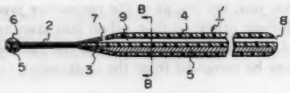
Hidenaga Yoshimura, Tokyo; Kunio Yamada, Nishio; Hironori Yamada, Okazaki; Ryusaku Yamada, Osaka, and Hiroaki Kudo, Nara, all of Japan, assignors to Toray Monofilament Company Limited, Aichi and Osaka City Government, Osaka, both of, Japan

Filed Jan. 29, 1980, Ser. No. 116,600

Claims priority, application Japan, Feb. 8, 1979, 54-12814; Oct. 26, 1979, 54-137558; Oct. 26, 1979, 54-137559; Oct. 26, 1979, 54-137560; Oct. 26, 1979, 54-137561

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—349 R **16 Claims**



1. A medical vascular guide insertable into a blood vessel for travel along the interior thereof; comprising

(a) an elongated tubular outer member having

(i) a manipulating part of first cross-sectional area;

(ii) a flexible part, of reduced cross-sectional area relative to said manipulating part;

(iii) a tapering part, connecting said manipulating part and said flexible part;

(b) an elongated metal member occupying the interior of said manipulating part of said tubular member;

(c) a tip member at an end of said flexible part remote from said tapering part, of integral unitary construction with said tubular member, of enlarged cross-sectional area relative to said flexible part;

(d) a second metal member occupying the interior of said tip portion;

(e) wherein said manipulating, tapering and flexible parts and said tip member are integrally formed of a single synthetic resin monofilament.

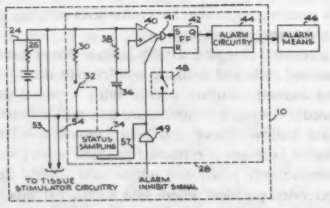
4,345,603
IMPLANTABLE BATTERY MONITORING MEANS AND METHOD

Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Feb. 19, 1980, Ser. No. 122,352

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PT **29 Claims**



1. In combination:

an implantable device having a battery contained therein;

a load means for drawing current from said battery;

first means for providing a first voltage related to the output voltage of said battery;

second means for periodically applying said load means to said battery, thereby generating a second voltage related to said loaded battery output voltage;

comparison means responsive to said first and second voltages for generating an output signal having a predetermined characteristic when said first and second voltages have a predetermined relationship with respect to each other, said output signal being related to the internal impedance of said battery; and

third means responsive to said output signal for indicating that said predetermined characteristic is present.

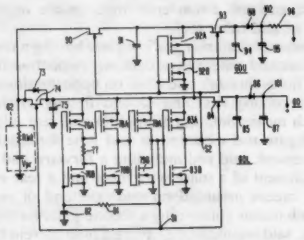
4,345,604
LONG LIFE CARDIAC PACER WITH SWITCHING POWER

Alexis C. M. Renirie, Dieren, Netherlands, assignor to Vitafin N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 956,605, Nov. 1, 1978, abandoned, which is a continuation of Ser. No. 802,736, Jun. 2, 1977, abandoned, which is a division of Ser. No. 651,549, Jan. 22, 1976, Pat. No. 4,031,899. This application Jul. 21, 1980, Ser. No. 170,686

Int. Cl.³ A61N *1/30*

U.S. Cl. 128—419 PS **4 Claims**



1. A self powered circuit for providing an output which is variable as a function of its available power, comprising a DC power source having characteristics subject to variation as a function of the power which it has delivered, and programmable conversion means connected to said source for converting the DC output of said source to a higher DC level, said conversion means providing a conversion which is a predetermined function of the power available from said source.

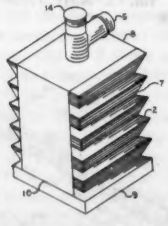
4,345,605
LUNG EXERCISER

Gordon A. Gereg, 557-A Blue Church Rd., Coopersburg, Pa. 18036

Filed Oct. 20, 1980, Ser. No. 199,084

Int. Cl.³ A61B *5/08;* A63B *23/00;* F16J *3/00*

U.S. Cl. 128—728 **6 Claims**



1. A device to provide volume exercise for a patients lungs said device comprising a lightweight bellows made up of a plurality of vertically spaced pairs of square layers of plastic film, each pair of layers being joined at their peripheral edge, each layer having an opening at the center thereof, the peripheral edge of one of said openings on each layer of said pairs of

layers being sealed to the peripheral edge of an opening on an adjacent layer of an adjacent pair of said layers, said openings in each layer defining an interconnecting passage between each pair of layers, a solid bottom layer sealed to the peripheral edge of the lowermost layer of said pair of layers, a top layer sealed to the peripheral edge of the uppermost layer of said pair of layers, said uppermost layer having an outlet opening therein, whereby a closed volume is formed with a passage out the upper most layer and being readily collapsible with very little resistance to collapse due to the lightweight and high flexibility said bellows an outlet fitting connected to said outlet opening adapted to be connected to tubing and thereby allow a patient to exercise by drawing air from the bellows into the lungs, the maximum volume capacity of said closed volume being greater than the amount, and means to reduce the volume of said bellows by partially collapsing the bellows or limiting its extension including a support system for the bellows, said support system comprising a foldable hanger in the shape of an inverted U having its bridge section connected to the outlet fitting and its legs extending downwardly on opposite sides of said bellows, the distance the bellows could extend being directly related to the volume in the bellows, a movable platform slidably mounted to each leg of said hanger adjacent the lowermost layer of said bellows wherein the extension of said bellows is limited in an adjustable fashion by a movable platform into which the legs of the U shaped hanger could slide, the position of the platform up or down the hanger being calibrated to bellows volume for prescribed lung volume exercise, said platform being an open top shallow box with opposing slots in which the legs of the hanger slide, wherein said box could act as a storage container for the collapsed bellows and folded hanger when not in use, the bellows further being provided with a skeleton made up of flat sheets of semi-rigid material, each sheet having a hole at the center for air flow and being inserted into each pair of layers of the bellows, whereby the bellows, when evacuated, will reduce in volume by the bottom moving up rather than having the sides cave in, said size of said sheets being also a free extension limit by limiting the amount the bottom could drop since the sides must move in a certain amount to have the bottom and top move apart.

4,345,606

SPLIT SLEEVE INTRODUCERS FOR PACEMAKER ELECTRODES AND THE LIKE

Philip O. Littleford, 251 Salvador Sq., Winter Park, Fla. 32789

Division of Ser. No. 9,137, Feb. 5, 1979, Pat. No. 4,243,050, which is a continuation-in-part of Ser. No. 860,246, Dec. 13, 1977, Pat. No. 4,166,469. This application Mar. 24, 1980, Ser. No. 133,325

The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.

Int. Cl.³ A61N *1/18*

U.S. Cl. 128—784 **10 Claims**

1. Apparatus for introducing an object into the human body, said apparatus comprising:

a tubular introducer with a tapered end adapted to extend into said body;

a hollow sleeve surrounding the introducer and formed of a tube having a first portion with an inner dimension greater than the outer dimension of said introducer and a second portion at one end of said sleeve which extends parallel with said introducer, said second portion dimensioned for close engagement with said introducer adjacent the tapered end thereof, with a gradual taper along said sleeve between said first and second portions; and

said sleeve having a longitudinally weakened line along said first portion from the other end of said sleeve, said weakened line extending through said taper and terminating short of said one end.

4,345,607

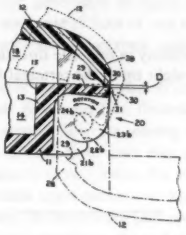
SPRING LATCH AND HINGE ASSEMBLY FOR CLOSURE MEMBERS

Joseph P. Contreras, Mendham, and George J. Sass, Bloomingdale, both of N.J., assignors to Corona Plastics, Inc., Denville, N.J.

Filed Nov. 28, 1980, Ser. No. 211,216

Int. Cl.³ A45D *33/00*

U.S. Cl. 132—83 R **12 Claims**



1. A spring latch and hinge assembly for a closure member pivotally connectible to a base member includes,

a. spaced hinge means including hinge elements connected respectively to the closure member and the base member to permit movement of the closure member to a full open position,

b. resilient means disposed between the spaced hinge means,

c. latch means disposed between the spaced hinge means to coact with the resilient means,

d. said resilient means has a rounded peripheral edge,

e. said latch means has a concave section inwardly of the end thereof disposed to engage the rounded end of the resilient means on movement of the closure member from full open to closed position and vice versa, and

f. an incremental section disposed for operative association between the resilient means and the latch means, and adjacent their peripheral edges so that a force must be exerted on the closure member during closing movement to compress the resilient means whereby said resilient means will exert a counterforce to prevent said closure member moving from the closed to the open position.

4,345,608

HAIR LIFT COMB

Joseph N. Cavaioli; Joseph R. Cavaioli, and James N. Cavaioli, all of Superior Comb Co., 301 Sixth St., Leominster, Mass. 01453

Filed Apr. 24, 1981, Ser. No. 257,178

Int. Cl.³ A45D *24/00*

U.S. Cl. 132—160 **4 Claims**

1. A comb for penetrating and lifting the hair comprising a handle, a series of generally parallel teeth thereon, each tooth

including a tapered raised portion thereon along the tooth, said raised portions extending away from the general plane of the

several teeth alternately in opposite directions, and each tooth having a plain straight tip at the terminal free end thereof.

4,345,609

RINSING AND DRYING APPARATUS

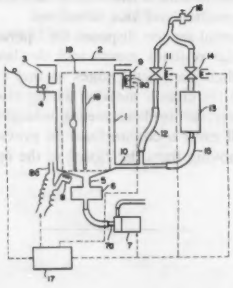
Hideyuki Nishizawa, 1-5-1, Nakazato-cho, Kita-ku, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,831

Claims priority, application Japan, Aug. 28, 1979, 54-110012

Int. Cl.³ B08B *9/00*

U.S. Cl. 134—57 R **5 Claims**



1. A drying apparatus comprising a vessel whose upper end is open; a cover detachable to the opening, which cover has no function of sealing the opening; a ventilating tube whose upper end is in communication with an upper portion of the vessel, said tube being provided with an electric heater in its inside and being in communication, at its lower end, with the atmosphere; a retarding tank being in communication with the lower end of the vessel; and a pump for draining the inside of the vessel by means of the retarding tank.

4,345,610

PROCESS AND DEVICE FOR THE MIXING OF GASES

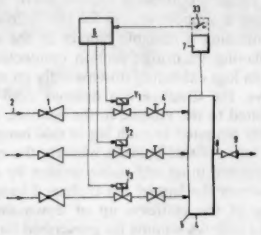
Martin Herter, deceased, late of Pulheim-Geyen, Fed. Rep. of Germany; by Johanna Herter, heiress, Romerfeldstr. 9, 5024 Pulheim-Geyen, Fed. Rep. of Germany; by Ingrid Radtke, heir, Schlehenweg 4, 4047 Dormagen 1 (Delhoven), Fed. Rep. of Germany; by Manfred Herter, heir, Im Bachgarten 56, 5024 Pulheim, Fed. Rep. of Germany, and Werner Oppel, Saarstr. 46, 5083 Rodenkirchen, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,460

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915983

Int. Cl.³ G05D *11/13*

U.S. Cl. 137—7 **5 Claims**



1. In a process for mixing gases for use in the treatment of workpieces by plasma discharges wherein gases from a plurality of reservoirs are fed individually to a mixing chamber by individual supply lines having magnetic valves which are normally closed and are opened for predetermined individual times in response to a pressure in said mixing chamber below a predetermined value whereby the amount of each individual gas fed to said mixing chamber being proportional to its predetermined individual time;

the step of controlling the opening and closing of said magnetic valves so that all magnetic valves reach the halftime of their respective total opening times at the same moment regardless of the total opening time of each magnetic valve.

4,345,611

SAFETY VALVE MEANS FOR BATTERY

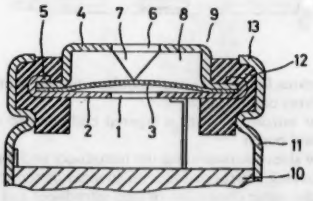
Hironosuke Ikeda, Hirakata; Hisao Oishi, Kobe, and Seiki Yoshida, Kakogawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 4, 1980, Ser. No. 156,512

Claims priority, application Japan, Jun. 7, 1979, 54-77862; Jul. 4, 1979, 54-92657

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—68 R **7 Claims**



1. A safety valve means for sealing an end of a battery casing comprising:

a lid plate having therein a valve hole,

a thin plate overlying said lid plate for covering said valve hole,

a terminal plate of reverse disk shape supported by said lid plate and having a gas vent and a cutter means projecting toward said thin plate in the area of said valve hole, the peripheries of said lid plate, thin plate and terminal plate overlying each other to form a multi-layer peripheral portion, said terminal plate forming a valve chamber together with said thin plate,

means for holding the periphery of said thin plate between the peripheries of said lid plate and said terminal plate by turning over an outer edge of said lid plate or said terminal plate, and

a separate annular resilient member having a small center opening disposed between said thin plate and said terminal plate, and located with its principal portion within said reverse disk shaped portion of said terminal plate and interior to said multi-layer peripheral portion, said resilient member being pressed by said terminal plate so as to press said thin plate toward said lid plate such that the portion of said thin plate which is located interior to said peripheral portion is supported against bowing in the region between said lid plate, annular resilient member and said terminal plate.

4,345,612

ANESTHETIC GAS CONTROL APPARATUS

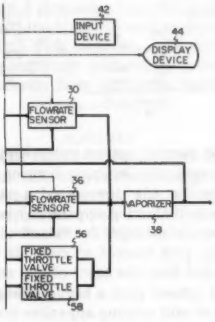
Tuyoshi Koni; Yoshihisa Urushida, and Akira Tsuzuki, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

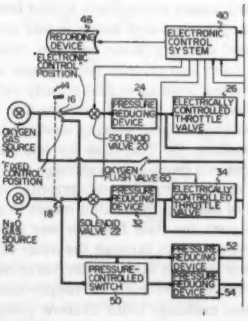
Filed Jun. 9, 1980, Ser. No. 157,581

Claims priority, application Japan, Jun. 12, 1979, 54-73835

Int. Cl.³ G05D *11/13*

U.S. Cl. 137—101.19 **8 Claims**





1. An apparatus for supplying a predetermined rate of flow of an anesthetic gas comprising a mixture of a first gas and a second gas, said first and second gases being provided from a first gas source and a second gas source, said apparatus comprising:

a first electrically controlled throttle valve coupled to receive said first gas from said first gas source, for producing a controlled flow thereof;

a second electrically controlled throttle valve coupled to receive said second gas from said second gas source, for producing a controlled flow thereof;

first flowrate sensing means for measuring the rate of flow of said first gas when output from said first electrically controlled throttle valve and for producing electrical signals of digital form indicative of the magnitude of said rate of flow;

second flowrate sensing means for measuring the rate of flow of said second gas when output from said second electrically controlled throttle valve and for producing electrical signals of digital form indicative of the magnitude of said rate of flow of the second gas;

data input means for generation of digital data to specify a predetermined total rate of flow of said anasthetic gas and to specify a predetermined mixture ratio of said first and second gases;

an electronic control system coupled to receive said digital electrical signals from said first flowrate sensing means and from said second flowrate sensing means and to receive said digital data from said data input means, and comprising memory circuit means for storing said digital data from said data input means and digital data processing circuit means for comparing said predetermined total rate of flow of said anasthetic gas and said predetermined mixture ratio of said first and second gases as represented by said stored digital data with an actual total rate of flow of said anasthetic gas and an actual mixture ratio of said first and second gases as represented by said digital electrical signals from said first and second flowrate sensing means and for producing control signals on the basis of said comparison, said control signals being applied to said first and second electrically controlled throttle valves for thereby bringing said actual total rate of flow of anasthetic gas and actual mixture ratio of said first and second gases into coincidence with said predetermined total rate of flow of said anasthetic gas and said predetermined mixture ratio of said first and second gases respectively;

electro-optical display means for displaying said predetermined total rate of flow of said anasthetic gas and said predetermined mixture ratio of said first and second gases stored in said memory circuit means; and

means for mixing said first and second gases after measurement of the rates of flow thereof by said first and second flowrate sensing means, for thereby providing said anasthetic gas further comprising first and second fixed throttle valves having the outputs thereof coupled to said means for combining the first and second gases; and manually a actuated gas switching means for selectively supplying either (1) said first gas from said first gas source to said first electrically controlled throttle valve and said second gas from said second gas source to said second electrically controlled throttle valve, or (2) said first gas from said first gas source to said first fixed throttle valve and said second gas from said second gas source to said second fixed throttle valve, and further comprising pressure controlled gas switch means located downstream of said second fixed throttle valve and responsive to pressure from said first gas source to allow flow of said second gas past said gas switch means only when the pressure of said first gas source is above a predetermined minimum pressure.

4,345,613

PRESSURE-OPERATED PORTABLE SIPHON APPARATUS FOR REMOVING CONCENTRATIONS OF LIQUID FROM A GAS PIPELINE

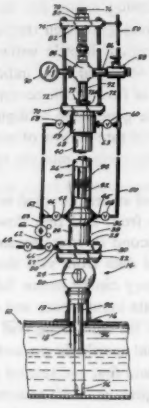
Walter C. Mills, San Angelo, Tex., and James W. Patterson, Hobbs, N. Mex., assignors to InterNorth, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 40,712, May 21, 1979, Pat. No. 4,282,894, which is a continuation-in-part of Ser. No. 832,673, Sep. 12, 1977, Pat. No. 4,155,372. This application May 18, 1981, Ser. No. 264,592

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

Int. Cl.³ F16K *51/00*; F17D *3/10*; F04F *10/00*

U.S. Cl. 137—317 3 Claims



1. In combination with a natural gas carrier pipeline having concentrations of liquid therein, comprising,

a first valve means mounted on the pipeline at the upper portion thereof and being in communication with the interior thereof,

a hollow support means being removably secured to said first valve means and extending upwardly therefrom; a hollow siphon pipe vertically movably mounted in said hollow support means and completely enclosed therein, said siphon pipe being movable from an upper position, wherein the lower end thereof is disposed above said first valve means, to a lower position wherein said siphon pipe extends through said first valve means with the lower end of said siphon pipe being positioned in said pipeline,

a piston means on said siphon pipe in said hollow support means,

a source of operating pressure in communication with the interior of said hollow support means above said piston means and with the interior of said hollow support means below said piston means,

first control valve means for selectively supplying said operating pressure to said hollow support means above said piston means whereby said siphon pipe and said piston means will be moved downwardly in said hollow support means towards the said lower position,

second control valve means for selectively supplying said operating pressure to said hollow support means below said piston means whereby said siphon pipe and said piston means will be moved upwardly in said hollow support means towards the said upper position above said first valve means,

and a second valve means mounted on said support means and being operatively fluidly connected to the interior of said siphon pipe above said first valve means for permitting the selective removal of the liquid in said pipeline by the gas pressure within the pipeline, upwardly through said siphon pipe when said siphon pipe is in its said lower position,

said source of operating pressure comprising a source of pressure selected from the group consisting of nitrogen, CO_2 and compressed air.

4,345,614

HYDRAULIC STEERING AND OPERATING DEVICE

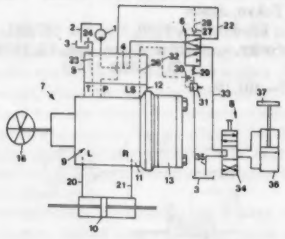
Niels G. Karlberg, and Poul H. H. Pedersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 18, 1980, Ser. No. 178,880

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934221

Int. Cl.³ F16K *49/00*

U.S. Cl. 137—340 3 Claims

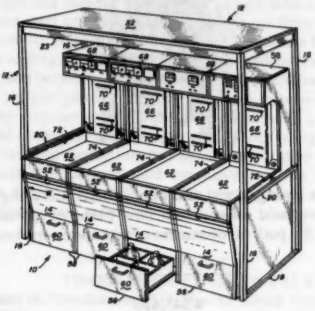


1. A hydraulic steering system comprising, pump and tank means, steering apparatus having a housing with supply and exhaust ports on one side thereof and a pair of servomotor operating ports, said steering apparatus having valve means with throttle supply passages for selectively directing fluid from said supply port thereof to either of said servomotor operating ports and from the other of said servomotor operating ports to said exhaust port, a heat exchange block attached to said one side of said steering apparatus housing and having a pair of supply conduit means and exhaust conduit means extending between one of said conduit means and connecting said pump and tank means respectively to said housing supply and exhaust ports, priority valve means in said conduit means having steering and auxiliary mode positions, branch conduit means extending from said priority valve means and forming auxiliary circuit means, connecting said priority valve means to upstream and downstream sides of said throttle supply passages to effect selection of said steering mode position or said auxiliary mode position, the fluid flow for said steering mode position being from said pump means through the other of said supply conduit means through said priority valve means through said one of said supply conduit means to said steering apparatus supply port, the fluid flow for said auxiliary mode being from said pump means through the other of said supply conduit means, and through said priority valve means to said auxiliary circuit means, said pairs of supply conduit means crossing in said heat exchange block to allow pressurized fluid passing through said other of said supply conduits through said priority valve means in said auxiliary mode to act in a heat exchange relationship with said one of said supply conduit means and said steering apparatus valve means.

4,345,615
MULTIPHASE MODULAR CHEMICAL PROCESSING STATION

Angelo S. Di Cicco, Sunnyvale, and Walter N. Quave, South San Francisco, both of Calif., assignors to Kay Plastic Products, Inc., Tempe, Ariz.

Filed Mar. 13, 1980, Ser. No. 130,149
Int. Cl.³ B08B *15/02*
U.S. Cl. 137—343 **16 Claims**



1. A multiphase modular chemical processing station comprising:

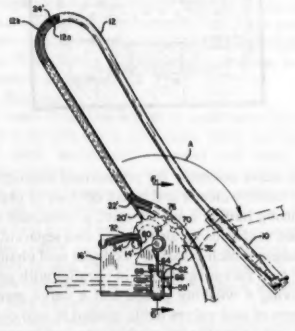
a fixed plumbing-electrical structure divided into a plurality of discrete module attachment positions including electrical connections and multiple fluid input and exhaust connections for each said position; and

a plurality of chemical processing modules, each module being adapted for rapid attachment to or detachment from one of said module attachment positions, each module being self contained for completely performing a desired chemical process independently from each other module.

4,345,616
RETRACTOR FOR HOSE-CONNECTED HAND PIECES

Paul V. Terry, P.O. Box 454, Tualatin, Oreg. 97062

Continuation-in-part of Ser. No. 130,707, Mar. 17, 1980, abandoned. This application Feb. 17, 1981, Ser. No. 234,828
Int. Cl.³ A61C *19/00*
U.S. Cl. 137—355.17 **6 Claims**



1. Retractable apparatus for hand pieces arranged for use with a fluid supply hose of the type having at least one supply passageway and an unused passageway,

(a) base member,

(b) an arm having opposite ends,

(c) and support means on said base member rotatably supporting said arm at one end thereof on said base member,

(d) the end of said arm opposite from its support on said base member comprising a tip end arranged to penetrate a hose and extend into the unused passageway of the hose,

(e) said arm extending interiorly along a portion of the unused passageway such as to provide an elongated support for the hose between its ends.

5. Retractable apparatus for hose connected hand pieces comprising

(a) a base member,

(b) an arm having opposite ends,

(c) a spindle on said base member rotatably supporting said arm for movement between non-use and use positions,

(d) means arranged to connect a hose intermediate its ends to said arm,

(e) a spiral spring on said spindle having one end connected to said arm,

(f) a collar on said spindle secured to the other end of said spring wherein said spring is tensioned upon movement of said arm from its non-use position to its use position whereby to automatically retract the arm upon release thereof,

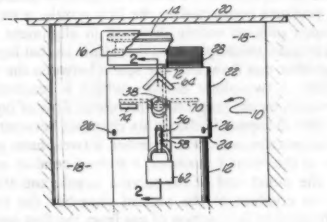
(g) friction means on said collar engageable with said spindle,

(h) and adjustment means operative on said friction means arranged to set said friction means on said spindle in a manner to provide a fixed anchor for said other end of said spring in the tensioned operation of said arm but allowing manual rotative repositioning of said collar on said spindle to change the retracting force of said spring.

4,345,617
LOCK APPARATUS FOR STORAGE TANKS

Sergio M. Bravo, 1823 N. Hill Dr., South Pasadena, Calif. 91030

Filed Mar. 11, 1980, Ser. No. 129,509
Int. Cl.³ B65D *39/16, 55/12, 55/14;* **F16K** *35/00*
U.S. Cl. 137—385 **12 Claims**



1. A lock apparatus for attachment to a pipe communicating with a storage tank for a flowable substance for preventing insertion of a foreign object into the storage tank through the pipe, comprising:

a cylindrical housing having a top part, a bottom part for attachment to the pipe, and a transverse orifice through the side of the cylindrical housing;

a plate pivotal in the interior of the cylindrical housing between a closed position and an open position;

an axle fixed to the plate and extending through the transverse orifice, the axle being pivotal in the transverse orifice to pivot the plate;

a latch member pivotally attached to the axle externally of the cylindrical housing, the latch member having a latch orifice therethrough;

a lock flange fixed to the external surface of the cylindrical housing between the radial orifice and the bottom part, the latch member being selectively positioned over the lock flange with the lock flange extending through the latch orifice when the plate is in the closed position to thereby couple the latch member to the lock flange; and

a tamper prevention flange fixed to extend radially from the external surface of the cylindrical housing in linear alignment with the transverse orifice and the lock flange.

4,345,618

ARRANGEMENT FOR THE REGULATION OF THE HEIGHT OF A LIQUID LEVEL

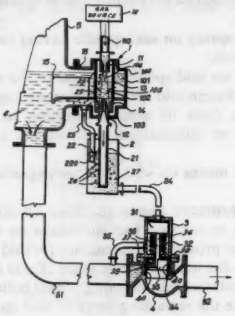
Josef Altman, Domazlice, and Zdenek Roth, Pilsen, both of Czechoslovakia, assignors to Skoda, oborovy podnik, Pilsen, Czechoslovakia

Filed Jan. 9, 1981, Ser. No. 223,902

Claims priority, application Czechoslovakia, Feb. 2, 1980, 1294-80

Int. Cl.³ F16K *21/16*; G05D *9/02*

U.S. Cl. 137—393 5 Claims



1. An arrangement for the regulation of the level of a liquid in a system having a collecting tank for the liquid, a first conduit connected to the tank for discharging liquid from the tank, and a controllable liquid discharge valve interposed in the first conduit, said arrangement comprising a first, influx chamber communicating with the interior of the tank, a first, downwardly directed transmitter nozzle disposed in the upper portion of the influx chamber, a source of gaseous medium under constant pressure connected to the first nozzle, a second, upwardly open pick-up nozzle disposed in alignment with the first nozzle and vertically spaced therefrom so that liquid in the influx chamber can flow into the space between the two nozzles to form a two-phase mixture which is received by the second nozzle, means restricting the rate of flow of liquid from the tank into the space in the influx chamber between the first and second nozzles, a second chamber, a two-phase, gas-liquid separatur in the second chamber, a second conduit connected between the outlet end of the second nozzle and the second chamber to conduct to the second chamber the two-phase mixture formed by interaction of gas from the first nozzle with the liquid in the influx chamber between the nozzles, means for separating the gas from the two-phase mixture in the second chamber, and means responsive to the pressure of the liquid which is separated from the gas in the second chamber to control the liquid discharge valve so as to maintain the level of the liquid in the tank substantially constant.

4,345,619

BACKFLOW PREVENTER

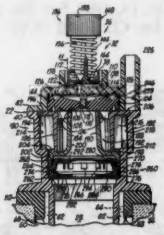
Dwight N. Johnson, El Toro, Calif., assignor to JH Industries, Inc., San Marcos, Calif.

Division of Ser. No. 47,945, Jun. 12, 1979, which is a division of Ser. No. 809,382, Jun. 23, 1977, Pat. No. 4,180,096. This application Jun. 19, 1980, Ser. No. 161,070

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—512.15 10 Claims

1. A backflow preventer comprising an upstream disc member having an annular array of upstream flow passages surrounding an impervious center region, a unitary elastomeric body including an outer ring and upstream and downstream flexible radially inwardly extending check valve portions each having a central opening; said upstream check valve portion overlying said upstream flow passages; a cup member between said check valve portions and having its convex side facing downstream; a rim on said cup member abutting the inner wall of said ring; an annular array of downstream flow passages in said cup member surrounding an impervious central region; said downstream check valve portion overlying said down-



stream flow passages; and said cup member including projections adjacent said downstream flow passages extending upstream into the path of movement of said upstream check valve portion.

4,345,620

SAFETY VALVE ASSEMBLY

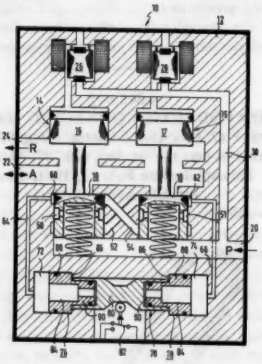
Erich Ruchser, Kernen; Helmut Ott, Stuttgart, and Günter Baidauf, Rommelshausen, all of Fed. Rep. of Germany, assignors to Technomatic AG, Aesch, Switzerland

Filed Jul. 17, 1980, Ser. No. 169,933

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930571

Int. Cl.³ F15B *13/043*, *20/00*

U.S. Cl. 137—596.16 9 Claims



1. A safety valve assembly for pressurized medium-operated devices, particularly clutch and brake devices of presses, comprising a housing having a supply inlet, a consumer outlet and a return outlet, said housing also having two separate chambers and two passages which crosswise connect said chambers with one another; two valves operating in parallel with one another and each having a working piston and a valve member, said valve members of said valves being guided in said chambers of said housing and operative for establishing and interrupting the communication between said inlet and outlets via said cross-passages so as to allow passage of a pressurized medium or to prevent the same; means for controlling the operation of said valves; pressure-sensing means having two opposite sides each communicating with a respective one of said cross-passages and displaceable in the event of malfunction from its inoperative position to its operative position; and actuating means arranged to turn off a consumer in response to the displace-

ment of said pressure-sensing means from its inoperative position to its operative position, said pressure-sensing means including a pressure balance having two sides each communicating with a respective one of said cross-passages so that when the pressure in said cross-passages and thereby at both sides of said pressure balance are identical said pressure balance remains immovable and is retained in its inoperative position, and when in the event of malfunction of pressure in one of said cross-passages and thereby at one of said sides of said pressure balance is greater than the pressure in the other of said cross-passages and thereby at the other of said sides of said pressure balance, said pressure balance is displaced from its inoperative position to its operative position, said pressure balance including a sliding member having an axis and movable in an axial direction between said inoperative and operative positions, and two stepped pistons located at axially opposite sides of said sliding member and each communicating with a respective one of said cross-passages, said stepped pistons being arranged so as to retain said sliding member in said inoperative position and to displace the same to said operative position in dependence upon the relation between the pressures of the pressurized medium in said cross-passages.

4,345,621

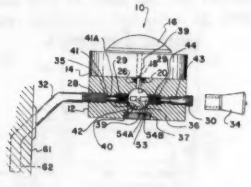
TIMED SHOWER HEAD VALVE

William H. Dunckhorst, P.O. Box 32, South Lake Tahoe, Calif. 95705

Continuation-in-part of Ser. No. 64,532, Aug. 5, 1979, Pat. No. 4,282,899, which is a continuation-in-part of Ser. No. 843,825, Oct. 20, 1977, abandoned. This application Feb. 2, 1981, Ser. No. 230,209

Int. Cl.³ B05B *1/30;* F16K *31/48*

U.S. Cl. 137—624.12 **4 Claims**



1. A valve assembly adaptable for mounting on a conduit leading to a bath shower head so as to conserve the amount of water employed for a complete shower in one cycle of operation of said assembly, by control of the time period of flow of water through said shower head, so as to provide timed period of water flow during one cycle of operation, in which

the assembly comprises

a valve housing

a clock timer device mounted to said valve housing and fitted with a rotatable shaft, said clock timer incorporating spring clock work mechanism to cause said shaft to rotate, at a uniform velocity in a second direction for a circular angular sector generally equal to the circular angular sector that said shaft has been initially rotated manually in a first direction, with a first end of said shaft attachable externally to a knob,

a circular valve member rotatably mounted in an interior chamber in said valve housing and attached to said shaft,

an interior chamber of a shape to fit about the circular perimeter of said valve housing,

an internal inlet port and an internal outlet port in said valve housing each joining said interior chamber by an individual passageway to an external inlet port and an external outlet port respectively,

a groove recessed in the circular perimeter of the valve member, with the axis of the groove lying substantially in a plane that intersects the axes of both internal inlet and outlet ports, said plane being substantially perpendicular to the axis of the rotatable shaft of the clock timer, and with each of two opposed ends of the groove separated from each other along the periphery of the valve member by a non-recessed section of the valve member periphery, where said non-recessed section extends along an angular sector, in said common plane, so as to completely block an internal inlet port or internal outlet port when said non-recessed section is aligned with said internal port,

a through passageway in said valve member joined at each opposed end to a section of the groove,

said groove and said non-recessed section located so that in the initial and final position of the valve member, recessed section completely blocks one internal port, in

a second position of the valve member, the recessed groove extends completely to both internal ports so as to permit water flow through said groove, and through said through passageway,

said initial and final position being a position that the valve member is rotated to, in a second direction by the timer shaft after the timer shaft has been rotated manually in the first direction, opposed to said second direction, from the said initial and final position to the said second position.

4,345,622

CONTROL AND CUT-OFF DEVICE FOR FLOWING MEDIA

Thom L. Henningsson, Sollentuna, Sweden, assignor to Ingenjorsfirma T. Henningsson AB, Sweden

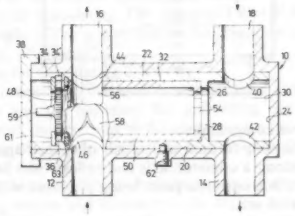
PCT No. PCT/SE79/00238, § 371 Date Jul. 24, 1980, § 102(e) Date Jul. 22, 1980, PCT Pub. No. WO80/01100, PCT Pub. Date May 29, 1980

PCT Filed Nov. 16, 1979, Ser. No. 199,507

Claims priority, application Sweden, Nov. 24, 1978, 7812130

Int. Cl.³ F17D *3/01;* F16K *5/10*

U.S. Cl. 137—637.1 **6 Claims**



1. A control and cut-off device for flowing media in plants where one or more consumer devices are to be supplied with a medium are connected to a source of such medium, said control and cut-off device including a valve housing having two connection openings for connection to said source of medium and two connection openings for connection to said consumer devices and control and cut-off members rotatable within the valve housing to control and cut-off the flow of medium from the source of medium to the consumer devices and again back to the source, the valve housing being provided with a cylindrical boring with which the connection openings communicate, a first tubular valve slide being rotatably mounted in the boring and having a cylindrical boring in which a second tubular valve slide is rotatably fitted, said slides being locked against axial displacement when in use and provided with openings arranged to effect control or cut-off, respectively, of the medium when rotating the slides, and wherein the first valve slide is provided with a peripheral annular locking ring arranged to lock the second valve slide against axial movement in relation to the first valve slide such that when said locking ring locks said second valve slide against axial movement said first and second valve slides are locked to rotate together within said valve housing, when said locking ring is released from locking the second valve slide, said first and second valve

slides are permitted to rotate relative to each other for selecting a control or cut-off mode of the flow of medium to at least one said consumer device, and when said locking ring again locks said second valve slide, said valve slides are rotationally locked together and said control and cut-off device is able to vary and block the flow of medium to the consumer device.

4,345,623

MULTIPORT DISK VALVE, ESPECIALLY FOR DUST-REMOVER DUCT SYSTEMS

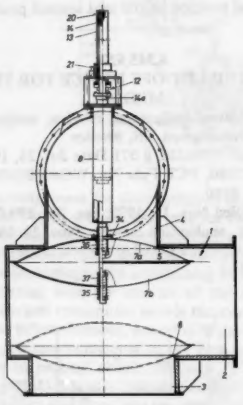
Walther Krull, Lübeck; Dieter Köhn, Neustadt, and Wolf-Dieter Schiller, Lübeck, all of Fed. Rep. of Germany, assignors to Beth GmbH, Lübeck, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 141,152

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 2916311

Int. Cl.³ F16K *31/122*; F17D *3/00*

U.S. Cl. 137—637.2 **7 Claims**



1. A valve comprising:

a valve housing formed with a pair of spaced-apart opposite ports along a common axis and at least one further port, each of said opposite ports being provided with a respective valve seat;

a valve plate in said housing between said opposite ports having a pair of oppositely convex shells each engageable with a respective one of said seats and concave toward one another; and

a pair of telescopingly engaged relatively shiftable rods extending along the axis of said opposite ports and each connected to a respective one of said shells for allowing said shells to be drawn together into mutually abutting relationship at their edges to form a closed double convex body engageable with either of said ports and allowing said shells to be urged by common movement of said rod to engage said seats selectively and, upon relative movement of said rods, to be urged individually into engagement with the respective seats.

4,345,624

BLOW-OUT GUARD FOR HIGH-PRESSURE HOSES

Thomas F. Rider, Manitowoc, Wis., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 121,904, Feb. 15, 1980, abandoned. This application Nov. 2, 1981, Ser. No. 317,080

Int. Cl.³ F16I *11/00*

U.S. Cl. 138—110 **9 Claims**

1. A blow-out guard assembly for use with a high-pressure conduit carrying fluids of the type having at least one coupling end, said assembly comprising:

at least a one layer sheath loosely circumferentially surrounding said high-pressure conduit and extending axially from said coupling end at least a finite length along said conduit, said sheath being a non-load bearing member during normal fluid flow loading of said conduit and having a plurality of interstices therethrough, said interstitial spacing being 20% at maximum; and

a ferrule covering and fixedly attaching one end of said sheath to said coupling end and leaving most of the sheath uncovered such that escaping effluents from said high-pressure conduit during blow out would pass through said interstices of said sheath causing the effluents to disperse and become harmless.

4,345,625

PIPE JOINTS OF REINFORCED RESIN AND PROCESS FOR THEIR MOLDING

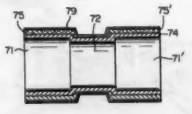
Masakatsu Mayumi, Osaka; Kenji Mitooka, and Sigeharu Fujiwara, both of Okayama, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

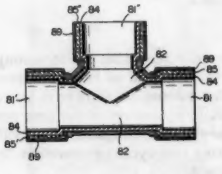
Division of Ser. No. 938,100, Aug. 30, 1978, Pat. No. 4,243,457. This application Aug. 13, 1980, Ser. No. 178,013

Claims priority, application Japan, Sep. 2, 1977, 52-106058; Sep. 19, 1977, 52-126434[U]; Dec. 1, 1977, 52-144796

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—141 **1 Claim**





1. A pipe joint having socket portions and one or more non-socket portions, said socket portions having a wall consisting of an inner surface layer composed of a cured reinforced resin molding material, an outer surface layer composed of a cured reinforced resin molding material, and an interlayer between said inner and outer layers composed of a cured resin mortar, said non-socket portions having a wall consisting of a cured reinforced resin molding material.

4,345,626

CIRCUMFERENTIAL STIRRUP PANEL

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

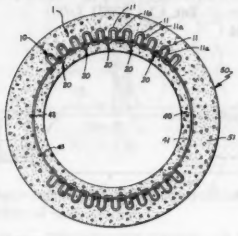
Continuation of Ser. No. 36,171, May 4, 1979, abandoned. This application May 20, 1981, Ser. No. 265,443

Int. Cl.³ B21F *27/22*

U.S. Cl. 140—107 **8 Claims**

1. A method for adding stirrup reinforcement to a concrete pipe reinforcing cage comprising the steps of: providing a mat comprised of a plurality of generally sinusoidal shaped stirrup members, each stirrup member including a plurality of nodes

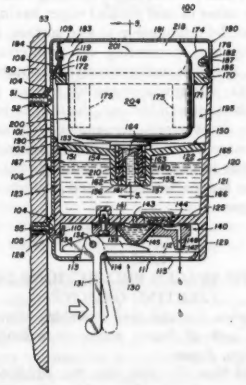
and antenodes, said stirrup members being oriented generally parallel to one another with said antenodes lying in a base plane and with said nodes projecting from said base plane, and said mat further including a plurality of tie wires joined to said stirrup members, said tie wires being oriented generally parallel to one another and generally perpendicular to said stirrup members; shaping said mat so that said stirrup members conform generally in curvature to the curvature of a cage to be reinforced at the area to be reinforced; and joining said mat to a pipe reinforcing cage with each of said sinusoidal stirrup members oriented to extend circumferentially with respect to said cage and with said tie wires oriented to extend longitudinally with respect to said cage.



4,345,627
SOAP DISPENSING SYSTEM

Antonio M. Cassia, Milan, Italy, assignor to Steiner Corporation, Salt Lake City, Utah

Filed May 16, 1980, Ser. No. 150,556
Claims priority, application Italy, Jan. 21, 1980, 19346 A/80
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—18 **33 Claims**

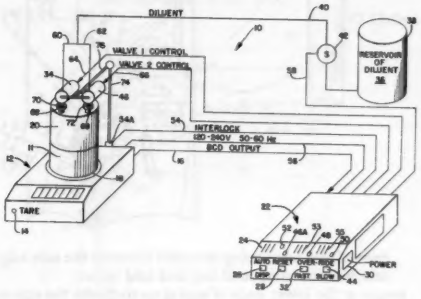


1. A system for dispensing liquid soap comprising a closed wall structure defining a container, partition means separating said container into a separate lower liquid soap reservoir and a separate upper refill compartment, dispensing means carried by said container for dispensing liquid soap from said reservoir, said partition means having a refill aperture therethrough providing the exclusive communication for soap flow between said reservoir and said refill compartment and dimensioned to permit the free flow of liquid soap therethrough, and a refill cartridge containing liquid soap and having an outlet, said refill cartridge being removably enclosed within said refill compartment in a refill configuration with said outlet disposed for cooperation with said refill aperture to permit the free flow of liquid soap from said refill cartridge to said reservoir thereby to refill said reservoir as liquid soap is dispensed therefrom.

4,345,628
GRAVIMETRIC DILUTER

Jeptha E. Campbell, Cincinnati, and James E. Gilchrist, Terrace Park, both of Ohio, assignors to Spiral Systems Inc., Cincinnati, Ohio

Filed Feb. 9, 1981, Ser. No. 232,525
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—83 **8 Claims**



1. An apparatus for diluting a sample within a container to a dilution factor f by weight of diluent comprising:

(a) means for repeatedly measuring the weight W of the sample plus any diluent within the container;

(b) means for choosing a dilution factor f by weight of a diluent to be used for diluting the sample;

(c) means for calculating TW wherein $TW=W/f$ and W is the weight of the sample within the container prior to the addition of diluent;

(d) means for calculating $TW-W$;

(e) fluid conducting means disposed between a reservoir of diluent and the container for permitting the diluent to flow from the reservoir to the container for the purpose of diluting the sample within the container to the selected dilution factor f; and

(f) valve means in fluid communication with the fluid conducting means and coupled to the means for calculating $TW-W$ for interrupting the flow of diluent between the reservoir and the container when $TW-W=0$ and permitting diluent to flow between the reservoir and the container when $TW>W$.

4,345,629
AUTOMATIC BAG HANGER

Wilfred L. Inglett, Jr., Augusta, Ga., assignor to Inglett & Company, Inc., Augusta, Ga.

Filed Jan. 26, 1981, Ser. No. 228,592
Int. Cl.³ B65B *3/16*
U.S. Cl. 141—114 **10 Claims**

1. A machine for hanging an empty opened bag on the filling spout of a bagging machine, comprising

a frame;

a magazine supported by said frame and adapted to hold a stack of collapsed bags;

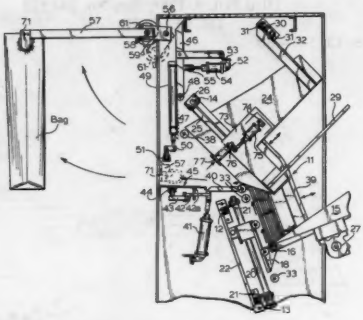
a bag support roll shaft extending across the central area of the magazine, which shaft will define upper and lower portions for the bags stacked in the magazine and draped over such shaft, the lower portions being positioned at an angle between approximately 10° and 30° from the vertical and the upper portions being positioned at an angle between approximately 10° and 25° greater than the angle for the lower portions;

lower vacuum means to grip the top end of the bottom bag

in the magazine and pull the upper portion of the bag downwardly from the magazine to a generally horizontal position;

upper vacuum means cooperating with the lower vacuum means to grip and open the said top end of the said bottom bag;

a pair of spaced transfer arms pivotally mounted at the upper end thereof to said frame above said magazine, the lower



ends of said arms being movable between the side edges of said horizontal opened bag and said spout;

means at the lower ends of said arms to clamp the side edges of the said opened bag to the transfer arms; and

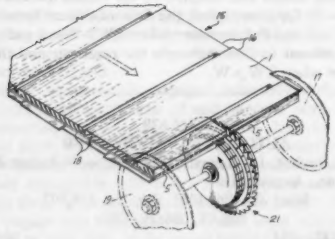
means for pivoting said transfer arms to pull the bag clamped to the transfer arms completely from the stack in the magazine and transfer such bag to a vertical position on the spout.

4,345,630

METHOD OF MAKING RABBETED SHINGLE BUTT JOINT SIDEWALL PANEL

Joe L. Bockwinkel, Winlock, and Willis G. Pehl, Chehalis, both of Wash., assignors to Shakertown Corporation, Winlock, Wash.

Filed Apr. 24, 1980, Ser. No. 143,301
Int. Cl.³ E04C *2/10, 2/40*
U.S. Cl. 144—346 **4 Claims**



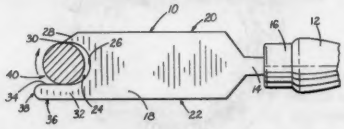
1. In a process for making weathertight laminated wood shingle panels including laying up an elongated backing sheet and a face layer of random width high quality wood face shingles having their lengths extending transversely of the backing sheet and generally lengthwise of their grain arranged in a row transversely of their lengths and lengthwise of the backing sheet with their longitudinal edges in edge-abutting relationship, the width of the backing sheet being substantially as great as the lengths of the shingles, and bonding the backing sheet and face layer together, the improvement comprising rabbeting, prior to assembling the face shingles in edge-abutting relationship, the face side only of a longitudinal edge of each random width face shingle generally parallel to the grain of the wood of such face shingle, and assembling the face shingles onto the backing sheet with the underside of each face shingle ungrooved.

4,345,631

WOOD TURNING TOOL

Anton J. Lemler, Rte. 6, Box 144, Sedalia, Mo. 65301

Filed Oct. 24, 1980, Ser. No. 200,463
Int. Cl.³ B25D *3/00*
U.S. Cl. 145—24 **1 Claim**



1. In a chisel for turning a workpiece spindle in a lathe, a chisel blade comprising:

an elongated flat bar having a semi-circular, template notch in one end thereof for clearing the workpiece and gauging the size and configuration of contours to be cut into the workpiece by the chisel,

said end having a beveled portion merging with said notch at one terminus of the latter presenting a sharp, leading cutting edge extending transversely of the bar and integral therewith; and

an elongated, imperforate tongue at said end, integral with the bar and extending outwardly beyond the opposite terminus of said notch in diametrically opposed relationship to said edge for guiding the chisel during turning of the workpiece into an operating position for cutting said contours,

said bar having a pair of opposed, flat parallel sides, said wall being perpendicular throughout to said sides and having a pair of opposed, flat parallel edges perpendicular to said sides, one of said parallel edges merging with said beveled portion, the other of said parallel edges having a stretch in opposed parallel relationship to said surface, the bar being solid throughout, presenting an uninterrupted, transversely flat, concave wall defining said notch, said tongue having a flat, workpiece-engaging surface parallel with the longitudinal axis of the bar, the tongue terminating in a convex tip transversely perpendicular to said sides,

said cutting edge extending uninterruptedly and linearly across the bar in perpendicular relationship to said sides and being in a predetermined fixed position with respect to said tongue.

4,345,632

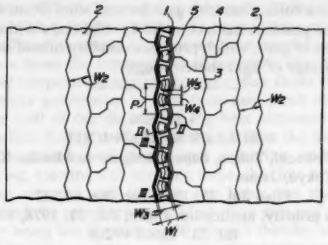
TREAD WITH SPACED PROJECTIONS IN STONE EJECTING GROOVE

Hiroyoshi Takigawa, Kodaira, and Nobuhiro Miyamura, Higashimurayama, both of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1980, Ser. No. 207,506
Claims priority, application Japan, Nov. 29, 1979, 54-153646
Int. Cl.³ B60C *11/04*
U.S. Cl. 152—209 R **11 Claims**

1. In a heavy duty pneumatic tire having a tread provided on its outer surface with a plurality of circumferential grooves, the improvement wherein at least one groove of said circumferential grooves is opened on said tread surface at an open groove width corresponding to 2–8% of a transverse width of said tread, has a groove bottom width substantially equal to said open groove width in such a medium narrowed shape that the groove width is gradually decreased from the edge of said open groove to a certain narrowed point in the depthwise direction of the groove and then gradually increased from said narrowed point to the groove bottom under no load, and is

provided on its groove bottom with multiple protrusions separated apart from the opposed groove walls of said groove and



at an interval between the adjoining protrusions in the circumferential direction of said groove.

4,345,633

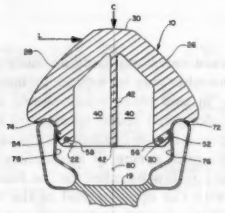
WEBBED NON-PNEUMATIC TIRE

Oscar P. Gilmore, 5909 Jurupa Ave., Riverside, Calif. 92504

Continuation-in-part of Ser. No. 911,204, May 31, 1978, and a continuation-in-part of Ser. No. 919,726, Jun. 27, 1978, abandoned. This application Feb. 2, 1979, Ser. No. 8,867

Int. Cl.³ B60C *7/12*

U.S. Cl. 152—328 **7 Claims**



1. A non-pneumatic tire of the type to be mounted on a rim formed with an axially extending central rim and axially spaced apart annular mounting flanges comprising:

a resilient circumferential tread wall having a radially outwardly facing tread surface;

a pair of axially spaced apart resilient elastic side walls projecting radially inwardly from said tread wall and cooperating therewith to form a circumferential cavity, said sidewalls terminating at their radial inner edges in shoulders for seating on the radial edges of said mounting flanges;

a pair of axially spaced apart elastic retaining flanges projecting radially inwardly from said respective sidewalls for being stretched over said rim mounting flanges and for receipt against the axially inner sides thereof, said retaining flanges terminating in radial inner edges spaced radially from axially extending surfaces of said rim;

a plurality of radially projecting resilient webs spaced apart substantially equidistant about the circumference of said cavity, extending axially between said retaining flanges and said side walls and attached thereto throughout substantially the radial width of said retaining flanges and said side walls to yieldingly urge said retaining flanges axially outwardly into engagement with said respective mounting flanges; and,

a single annular elastic stabilizing band disposed in said cavity, centrally between said sidewalls and of a circumference sufficient to be held under tension when said tire retaining flanges are mounted on said rim mounting flanges whereby said tire may be mounted on said rim with said retaining flanges retained between said mounting flanges and pushed thereagainst by said webs and when weight is applied to said rim while said tire rolls on a support surface said sidewalls will carry said weight and when said webs pass sequentially between said rim and support surface they will cooperate with said sidewalls to provide irregular support.

4,345,634

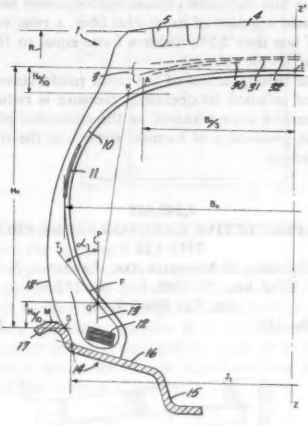
TIRE FOR MEDIUM AND HEAVY CARRIER VEHICLES

Daniel G. Giron, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland

Filed Jun. 4, 1980, Ser. No. 156,338

Int. Cl.³ B60C *9/08, 3/00*

U.S. Cl. 152—353 R **13 Claims**



1. A tire for medium and heavy carrier vehicles having a tread, a radial carcass reinforcement anchored to at least one bead ring in each bead and a tread reinforcement formed of at least two plies of wires or cables parallel in each ply and crossed from one ply to the next, forming acute angles with the longitudinal direction of the tire, the radial carcass reinforcement having, when the tire is mounted on a rim and inflated to its operating pressure but not under load, as seen in meridian cross section, a neutral fiber whose point of intersection with the trace of the equatorial plane of the tire is at a radial distance from the point of contact of the tire with the flange of the rim at most equal to 0.65 times the maximum axial width of the neutral fiber, the width of the rim being at least equal to 0.88 times the maximum axial width of the neutral fiber, characterized

by the fact that the tire being mounted on the rim and inflated to its operating pressure but not under load, the length of the segment of the neutral fiber of the radial carcass reinforcement between, on the one hand, a radially inner extreme point located at a radial distance outward of the point of contact of the tire with the flange of the rim equal to 0.1 times said radial distance between said point of contact and said point of intersection and, on the other hand, a radially outer extreme point located axially outward of said point of intersection and at a radial distance inward of said point of intersection equal to 0.1 times said radial distance between said point of contact and said point of intersection, is less than 1.20 times the distance between the two extreme points of said segment of the neutral fiber of the radial carcass reinforcement, said point of contact being located radially and axially inward of the point of maximum radial height of the flange of the rim,

by the fact that the beads of the tire being mounted on the

rim in their operating position and the tire being not inflated and not under load, the neutral fiber of the radial carcass reinforcement passes through a point located, on the one hand, radially inward of the point of intersection of the neutral fiber of the radial carcass reinforcement with the trace of the equatorial plane at a distance at most equal to 0.075 times the maximum axial width of the neutral fiber of the radial carcass reinforcement when the tire is mounted and inflated but not under load and, on the other hand, axially outward of the trace of the equatorial plane at a distance equal to one-third of the maximum axial width of the neutral fiber of the radial carcass reinforcement of the tire when mounted and inflated, said neutral fiber of the radial carcass reinforcement being symmetrical with respect to the trace of the equatorial plane, and

by the fact that the radial carcass reinforcement has, at least along said segment of its neutral fiber, a relative elongation of less than 2.5% under a force equal to 10% of its ultimate tensile strength,

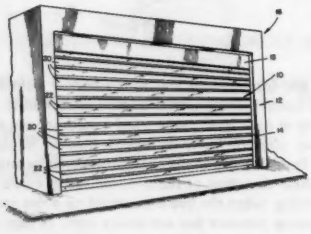
whereby the belting action of the tread reinforcement under the effect of inflation to operating pressure is reduced to a relatively narrow zone centered on the equatorial plane so as to avoid the generation of harmful stresses at the tread reinforcement edges.

4,345,635

ROLLING PROTECTIVE GATE FOR STORE FRONTS OR THE LIKE

Martin D. Solomon, 26 Margaret Ave., Lawrence, N.Y. 11559

Filed Aug. 29, 1980, Ser. No. 182,577
Int. Cl.³ E06B *9/08*
U.S. Cl. 160—133 **10 Claims**



1. A rolling gate adapted to provide a transparent displaceable security closure for a building access opening defining a store front, said gate comprising:

a plurality of elongated transparent slats disposed horizontally in vertically-spaced relationship, each slat having a narrow, rectangular body portion and being sized to extend across the entire width of said access opening,

a plurality of elongated metal rods interconnecting said slats in their spaced relationship, with each rod being sized to extend across the entire width of said access opening,

each of said elongated metal rods being elliptical in cross section and having convex front and rear walls, each rod having a height appreciably less than the height of the body portion of each slat, and a width appreciably greater than the thickness of the body portion of each slat,

and coupling means formed integrally on each of said slats and rods for pivotally connecting each transparent slat along its entire upper and lower edges between a pair of adjacent rods to form the assembled gate,

said coupling means comprising an enlarged bead formed integrally along the full length of each longitudinal edge of the narrow body portion of each transparent slat, and a pair of elongated sockets of circular cross-section formed integrally in the upper and lower portions of each metal rod and extending the full length of said rod, each of said sockets being sized to receive the enlarged bead of an adjacent slat for turning movement therein,

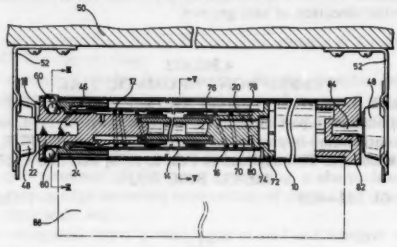
whereby said interconnected and articulated slats and rods provide a rolling security gate for said store front, which, in lowered position, has a completely solid body without interruptions or gaps, which provides visibility of said store front and passage of light therethrough.

4,345,636

ROLLER SCREEN UNIT

Shigeki Fukuchi, Tokyo, Japan, assignor to Metako Kigyo Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,387
Claims priority, application Japan, Jul. 31, 1978, 53-93248
Int. Cl.³ E06B *9/208*
U.S. Cl. 160—297 **5 Claims**



1. A roller screen unit comprising an outer roller sleeve on which a screen member may be wound, an intermediate sleeve received loosely in said outer roller sleeve, a core member loaded with an elongated spiral spring and received in the intermediate sleeve, a clutch mechanism connected to one end of the elongated spiral spring in association with the outer roller sleeve, and a pillow member for the intermediate sleeve and connected with the opposite end of the elongated spiral spring, said clutch mechanism including a stator member comprising a cylindrical body having one end adapted to be suspended by a bracket and provided with a cover disk with an abutting drum section in which one or more cavities are formed said drum section having an annular rim spaced from said cover disk, and being further provided on its periphery spaced from said annular rim with an elastically projected stopper means, and at the opposite end with an extended shaft adapted to be inserted into one end of the core member and with a channel having a pocket for receiving and engaging with the one end of the elongated spiral spring, a rotator member rotatably mounted on the stator member comprising a sleeve body with a flanged end in which one or more chambers with contiguous recesses are formed, and balls received within said recess to form ball clutch means.

4,345,637

METHOD FOR FORMING HIGH FRACTION SOLID COMPOSITIONS BY DIE CASTING

Merton C. Flemings, Cambridge, Mass.; Rodney G. Riek, Maryland Heights, and Kenneth P. Young, Ballwin, both of Mo., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 853,795, Nov. 21, 1977, abandoned. This application Nov. 15, 1979, Ser. No. 94,636
Int. Cl.³ B22D *17/00*
U.S. Cl. 164—113 **10 Claims**

1. The method of casting a metal composition which is at least partially liquid and when partially liquid contains between about 1 weight percent and about 85 weight percent degenerate dendrites homogeneously dispersed within a liquid phase of said metal composition which comprises injecting under pressure said metal composition into a die formed of a

material having a thermal diffusivity of at least about 0.5 cm^2/sec, solidifying said material in said die, ejecting the solidified material from said die and maintaining said die at an original mean die temperature prior to said injecting step of not more than 400° F. by spraying the cavity surface of the die directly with a liquid coolant, the temperature of the liquid being sufficiently low so as to reduce the mean die temperature back to a mean die temperature of not more than its original mean die temperature and to not more than about 400° F. and to minimize penetration of heat from said metal composition into the wall of the die so that the heat extracted from said composition during casting is removed from the mold during the subsequent spraying step and repeating said injecting, solidifying, ejecting and spraying steps, the time between said injecting step and said ejecting step being less than about 1 minute and the time between said ejection step and said spraying step being less than about 30 seconds thereby to minimize penetration of heat from said metal composition into the wall of the die so that the heat extracted from said composition during casting is removed from the mold during the subsequent spraying step.

4,345,638

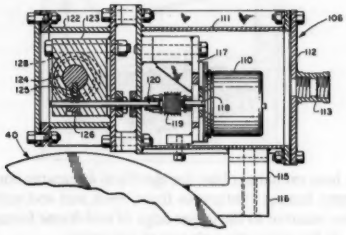
FOUNDRY MOLDING METHOD

Rudolf Hermes, Parma, Ohio, assignor to The Osborn Manufacturing Corporation, Cleveland, Ohio

Division of Ser. No. 64,008, Aug. 6, 1979, Pat. No. 4,248,290. This application Nov. 17, 1980, Ser. No. 207,792

Int. Cl.³ B22C 9/20

U.S. Cl. 164—456 **18 Claims**



1. A method of metal founding, comprising forming a mold cake with a casting forming surface in at least one vertically oriented face thereof, and transferring such cake toward a pouring station, including bringing a pusher at zero speed into engagement with such cake, wherein the method further comprising measuring a dimensional parameter of s[illegible] cake, and using such parameter to control movement of s[illegible]h pusher.

4,345,639

HEAT STORAGE UNITS

Richard J. Lane, Moddershall, Near Stone, England, assignor to Ti Creda Manufacturing Limited, Stoke on Trent, England

Filed Jul. 5, 1979, Ser. No. 55,000

Int. Cl.³ F28D 17/00; F24H 7/04

U.S. Cl. 165—10 **13 Claims**

1. A heat storage unit comprising:

a housing;

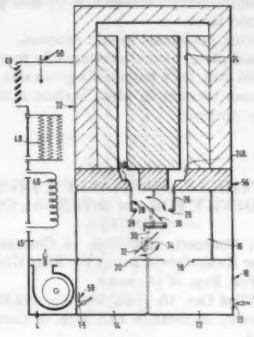
an air inlet and an air outlet extending into the housing;

means within the housing defining a flow path extending between the inlet and the outlet;

heat storage elements mounted in the housing, said heat storage elements defining passage means extending between the heat storage elements, said passage means communicating with an opening in an ancillary chamber in the housing;

impeller means on the housing and which is operative to cause air flow into the air inlet and from the air outlet;

a valve member mounted adjacent to the opening in the ancillary chamber; drive means connected to said valve member and which is operative to move the valve member between a first position in which said valve member divides the ancillary chamber into an inlet section in communication with an upstream flow section of the heat storage elements and an outlet section in communication with a downstream flow section of the heat storage elements, and a second position in which the valve member



extends across the opening of the ancillary chamber to close the opening;

whereby when the valve member is in its first position the impeller means is operative to cause air to flow from the inlet to the outlet through said heat storage elements, and when the valve member is in its second position said impeller means is operative to cause air to flow from the inlet to the outlet with no significant flow of air through said heat storage elements.

4,345,640

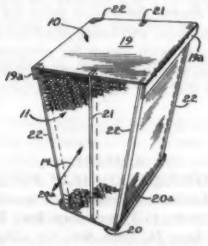
REGENERATIVE HEAT EXCHANGER BASKET

Edward J. Cullinan, 411 Opatrny Dr., Fox River Grove, Ill. 60021

Filed May 11, 1981, Ser. No. 262,470

Int. Cl.³ F28D 19/04

U.S. Cl. 165—10 **1 Claim**



1. In a basket for use in a regenerative heat exchanger of the type wherein a fluid to or from which heat is to be transferred is passed through the basket from one end thereof to another end thereof and wherein there is a space of a predetermined size in the heat exchanger which is available to receive the basket, said basket comprising an outer frame open at said ends, a stack of a plurality of heat exchange plates within said frame, each of said plates having end edges generally corresponding to said ends of the basket, said plates abutting adjacent plates of the stack and defining fluid passages therebetween which passages extending from end to end of the plates, said frame including a plurality of bars across said ends of the basket to

prevent said plates from shifting endwise in the basket, each of said bars having a first face of a given width in juxtaposition to the plate edges and a second face of a given width which is generally normal to said end edges, the improvement comprising:

each of said plates having a recess at each location where the plate abuts a bar, each recess having a width as measured parallel to the edge of the plate which substantially corresponds to said given width of said first face, and having a length as measured normal to said end edge of the plate which substantially corresponds to said given width of said second face,

said bars being positioned in said recesses,

whereby said plates extend substantially to said ends of the basket and thus, for a basket of a given size, there is nearly a maximum amount of plate surface available for heat exchange purposes.

4,345,641

MOTOR VEHICLE, ESPECIALLY A TRUCK, WITH A COOLING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

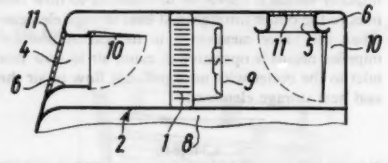
Kurt Hauser, Stuttgart, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 195,857

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941014

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—41 **14 Claims**



1. A motor vehicle with a cooling device for an internal combustion engine, said cooling device comprising at least one heat exchanger, said heat exchanger being mounted in an elevated position on top of or behind a cab of the vehicle, the improvement comprising a liquid-collecting container means which is provided about said heat exchanger, said liquid-collecting container means being resistant to pressure and breakage, being closed except for one or more air intake openings and air exhaust openings, and being provided at said air intake and exhaust openings with means for ensuring that said container means serves as a liquid-collecting chamber for coolant that escapes from the heat exchanger in any position of the vehicle.

4,345,642

ARTICULATED HEAT PIPES

Donald M. Ernst, Leola, and Richard L. Copenhaver, Rothsville, both of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed Dec. 24, 1980, Ser. No. 220,074

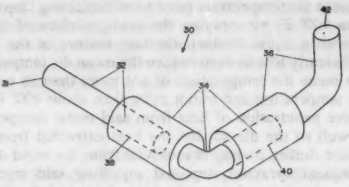
Int. Cl.³ F28D *15/00*; F28F *5/00*

U.S. Cl. 165—86 **6 Claims**

1. A heat pipe assembly comprising:

at least two heat pipes with tubular casings with a first heat pipe having its casing constructed with an angle and a cavity in one end shaped as a cylinder;

a second heat pipe having its casing constructed with an angle and with a first end shaped to match and inserted into the cavity in the first heat pipe, the first end of the second heat pipe differing in dimension from the cavity of the first heat pipe into which it is inserted sufficient to provide a gap between the outer surface of the second heat pipe and the inner surface of the first heat pipe, the thickness of the gap being within the range of 0.001 inch to 0.015 inch; and



a heat conducting fluid inserted into the gap and conducting heat between the surfaces forming the gap.

4,345,643

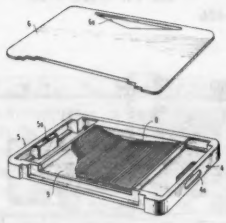
HEAT EXCHANGER BASE FOR A PORTABLE LASER SYSTEM

Stanley R. Dawson, Corona, and Cecil L. Hayes, Placentia, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 24, 1980, Ser. No. 210,068

Int. Cl.³ F28F *3/06*

U.S. Cl. 165—122 **7 Claims**



1. A heat exchanger base for electrical apparatus comprising,

a frame having contiguous front, back and end walls;

a plate secured to the upper edge of said frame forming a top wall for supporting electrical apparatus;

a bottom plate secured to the lower edge of said frame;

radiator means including a shelf mounted within said frame between and extending substantially parallel to the top and bottom plates and a plurality of like heat-radiating fins supported on said shelf and extending between said front and backwalls, the bottom surface of said top plate engaging the top edges of said fins; and

air inlet and outlet means provided in said base communicating with respective opposite front and back portions of said radiator means for causing heat generated by the apparatus to be conducted through the top wall and dissipated through said radiator means.

4,345,644

OIL COOLER

Detlef B. Dankowski, 921 Westbrook, Garland, Tex. 75043

Filed Nov. 3, 1980, Ser. No. 203,135

Int. Cl.³ F28F *1/42, 9/22*

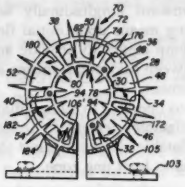
U.S. Cl. 165—154 **14 Claims**

1. A fluid cooler comprising:

a body defining a plurality of circumferentially spaced interconnected passageways, each passageway having a forward and rearward end with alternate ends of said passageways being in fluid communication to provide a continuous circuitous passageway for fluid from a first passageway through intermediate passageways to an exhaust passageway, said first passageway being completely sepa-

rated from said exhaust passageway by a heat exchange fluid gap;

means for injecting fluid into the first passageway; and



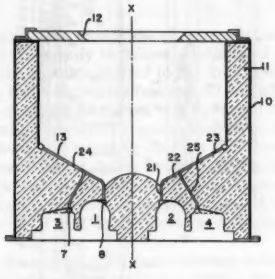
a discharge aperture permitting fluid discharge from the exhaust passageway.

4,345,645

HOT GAS ENGINE HEATER HEAD

Jan C. Bratt, Malmö, Sweden, assignor to Kommanditbolaget United Stirling AB & CO, Malmo, Sweden

Filed Oct. 20, 1980, Ser. No. 199,007
Int. Cl.³ F24J *3/00*
U.S. Cl. 165—176 **3 Claims**



1. A multiple cylinder hot gas engine heater head in which a plurality of tubes connect the cylinders with the corresponding regenerator housings and in which each tube has a first curved part of a shape which corresponds substantially to the shape of an involute curve on a cone and in which the inner ends of the tubes start on a base circle and the first curved parts are juxtaposed so that constant gaps between the curved parts are obtained, characterized in that each tube has a second curved part following a different involute curve on the same cone starting in continuation of the said first curved part wherein the second curved parts are juxtaposed leaving a constant gap between the second curved parts.

4,345,646

APPARATUS FOR CHEMICAL CUTTING

Jamie B. Terrell, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Continuation of Ser. No. 877,085, Feb. 13, 1978, abandoned.
This application Sep. 24, 1979, Ser. No. 78,472
Int. Cl.³ E21B *29/02*
U.S. Cl. 166—55 **12 Claims**

1. A downhole chemical fluid jet cutting tool adapted to be suspended from an electrical wireline comprising in combination:

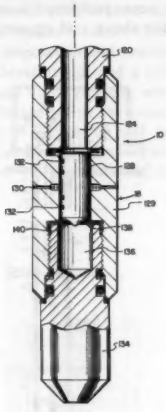
(a) an elongated generally cylindrical tool body;

(b) a generally cylindrical slip body means forming part of said tool body and comprising a pipe gripping slips array connected into a fluid pressure responsive co-axially disposed expandable piston-cylinder means;

(c) said piston-cylinder means being biased toward a retracted position by elastic return means;

(d) each slip of said slips including a head at a first end being retained by said slip body and being biased toward a retracted position from a deployed position by positive retraction means;

(e) said piston-cylinder means including a slip expansion mandrel means disposed within said slip array to deploy said slips into gripping engagement as said piston-cylinder



is actuated against said elastic return means in response to application of fluid pressure;

(f) a chemical fluid cutting means forming part of said tool body including a fluid chamber adapted to contain a fluid chemical defined within said tool body between two diaphragm means provided to rupture from application of a designated differential fluid pressure; and

(g) a fluid jet discharge means formed in said tool body and adapted to direct fluid chemical from said tool body in selected direction and at high velocity.

4,345,647

APPARATUS TO INCREASE OIL WELL FLOW

William C. Carmichael, 3806 N. Stratford Rd., NE., Atlanta, Ga. 30342

Filed Jul. 18, 1980, Ser. No. 169,943
Int. Cl.³ E21B *23/06, 33/127, 43/18, 47/04*
U.S. Cl. 166—66 **1 Claim**

1. An oil well construction for extracting oil bearing liquid from an oil bearing formation in the ground including:

a tubular well casing extending into the ground past the oil bearing formation, said well casing including an upper end extending above the ground and a lower end located below the oil bearing formation, said well casing defining a plurality of openings therethrough communicating with the oil bearing formation so that the oil bearing liquid flows in said casing through said openings, said well casing defining a sump therein between said openings and the lower end of said well casing to collect the oil bearing liquid therein;

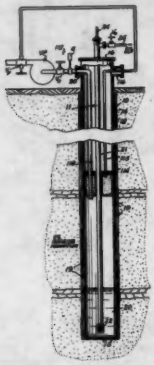
lift means for removing the oil bearing liquid from said sump, said lift means including an oil lift pipe extending into said well casing from the upper end thereof, said lift pipe defining an intake thereto located in said sump;

upper liquid level sensing means positioned in said sump in said well casing at a position just below the lowermost of said openings through said well casing and operatively connected to said lift means to cause said lift means to remove the oil bearing liquid from said sump when the

level of the oil bearing liquid in said sump rises to the level of said upper liquid level sensing means;

lower liquid level sensing means positioned in said sump in said well casing below said upper liquid level sensing means and at a position just above said intake to said lift pipe and operatively connected to said lift means to cause said lift means to stop the removal of the oil bearing liquid from said sump when the level of the oil bearing liquid in said sump is lowered to the level of said lower liquid level sensing means;

inflatable sealing means positioned in said well casing around said oil lift pipe above said openings through said well casing and;



vacuum producing means including a vacuum pump having a pump inlet and a pump outlet, said pump inlet communicating with the inside of said casing between said sealing means and the oil bearing liquid in said sump to impose a vacuum therein so that said vacuum is imposed on the oil bearing formation through said openings in said well casing to assist in the extraction of the oil bearing liquid from the oil bearing formation and said pump outlet communicating with said inflatable sealing means to inflate said sealing means and seal said well casing around said oil lift pipe above said openings through said well casing.

4,345,648

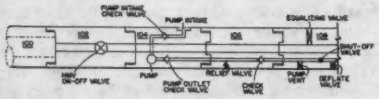
INFLATABLE PACKER SYSTEM

Felix Kuus, Huntington Beach, Calif., assignor to BJ-Hughes, Inc., Long Beach, Calif.

Filed Feb. 11, 1980, Ser. No. 120,418

Int. Cl.³ E21B *33/127*

U.S. Cl. 166—106 **63 Claims**



1. An inflatable packer system with a central unrestricted bore adapted to be lowered on a tubular member into a well annulus having a wall for isolating at least one zone in the well during test comprising;

at least one inflatable element in said system adapted to be located adjacent said at least one zone;

pump means in said system operable upon rotation of said tubular member to provide inflation fluid;

inflation fluid passage means separate from said central unrestricted bore between said pump means and said at least one inflatable element;

valve means in said system for controlling flow of inflation fluid to said at least one inflatable element;

said valve means including an outer sleeve housing means;

shifting sleeve means in said valve means adapted to be shifted downward longitudinally with respect to said sleeve housing means upon initial flow of inflation fluid from said pump means to provide an inflation fluid passageway between said pump means and said at least one inflatable element;

said pump means operable to pump inflation fluid into said at least one inflatable element to sealingly engage said at least one inflatable element against the well annulus wall to isolate said at least one zone.

4,345,649

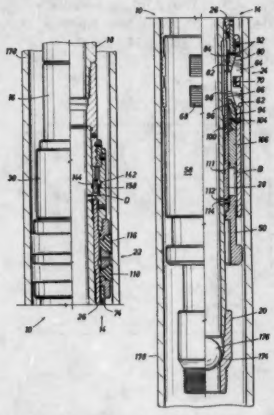
WELL PACKER

John L. Baugh, and James W. Montgomery, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Sep. 5, 1980, Ser. No. 184,674

Int. Cl.³ E21B *33/128, 33/129*

U.S. Cl. 166—120 **7 Claims**



6. A well packer for releasable setting within a well conduit comprising:

a. a central mandrel extending within an outer assembly;

b. holding means for releasably connecting said mandrel to said outer assembly against relative axial movement therebetween, said holding means being releasable by rotation of said mandrel relative to said outer assembly;

c. sleeve means, as part of said outer assembly;

d. seal means mounted on said sleeve means and movable generally radially between a retracted configuration and an extended configuration in which said seal means may sealingly engage said conduit;

e. first lock means engageable with said sleeve means for locking said seal means in said extended configuration;

f. anchoring means, as part of said outer assembly, movable generally between a retracted position and an extended position for grippingly engaging said conduit; and

g. second lock means engageable with said sleeve means for locking said anchoring means in said extended position.

4,345,650

PROCESS AND APPARATUS FOR ELECTROHYDRAULIC RECOVERY OF CRUDE OIL

Richard H. Wesley, P.O. Box 218429, Houston, Tex. 77218

Filed Apr. 11, 1980, Ser. No. 139,438

Int. Cl.³ E21B *43/25*

U.S. Cl. 166—249 **21 Claims**

1. A process for stimulating recovery of crude oil from oil

bearing earth formations wherein such oil is incapable of migrating through the formation in commercially producing quantity, said process comprising:

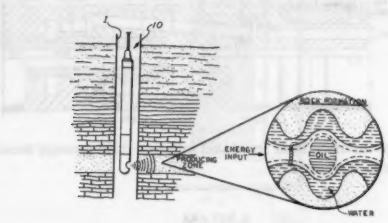
locating a pair of electrodes within a well bore, said electrodes being in spaced relation and defining a spark gap therebetween;

developing first and second electrical charges substantially at the level of the oil bearing earth formation;

releasing said first electrical charge into said spark gap to render said spark gap conductive;

releasing said second electrical charge into said conductive spark gap to generate said explosive spark;

said explosive spark introducing intense shock waves into said oil bearing formation at the level of said formation, said electrical spark generated shock waves being of sufficient magnitude to modify the oil retention quality of said formation sufficiently to release a substantial quantity of oil from the adhesion thereof to the formation;



introducing hydraulic waves into said oil bearing formation at the level of said formation, said hydraulic waves being generated by said electrical spark simultaneously with said shock waves and traveling through said formation at a rate of speed that is slower as compared to the speed of said shock waves; said hydraulic waves inducing released oil to migrate forcibly away from the point of energy introduction of said shock waves and hydraulic waves; and

producing the migrating oil from adjacent collection wells positioned in spaced, surrounding relation with said point of energy introduction into said formation.

4,345,651

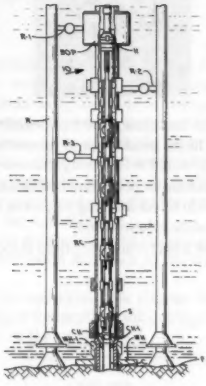
APPARATUS AND METHOD FOR THE MECHANICAL SEQUENTIAL RELEASE OF CEMENTING PLUGS

Neil H. Akkerman, Kingwood, and Gonzalo Vazquez, Houston, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Mar. 21, 1980, Ser. No. 133,363
Int. Cl.[3] E21B *33/16*
U.S. Cl. 166—291 **8 Claims**

4. An apparatus for holding and selectively mechanically releasing a plug device used in cementing a subterranean well, said apparatus being securable on a longitudinally and rotationally manipulatable conduit communicating with said well, said apparatus comprising: an elongated cylindrical housing; control head means positioned within said housing and shiftable in response to manipulation of said conduit from closed position whereby said plug device is prevented from passing through said control head means to open position whereby said plug device is permitted to pass through said control head means; means for transferring at least one of longitudinal and rotational manipulation of said conduit to said control head means to selectively shift said control head means between closed and open positions; and plural control head means positioned within said housing and sequentially shiftable from closed position to open position, one after another.

7. In a method of cementing a subterranean well wherein plug devices are dropped within a first conduit in the well, the steps of: (1) extending to said first conduit an apparatus for holding and selectively mechanically releasing a plug device used in cementing said well, said apparatus being securable on a longitudinally and rotationally manipulatable second conduit communicating with said well, said apparatus comprising: an elongated cylindrical housing; control head means positioned within said housing and shiftable in response to manipulation of said second conduit from closed position whereby said plug device is prevented from passing through said control head means to open position whereby said plug device is permitted to pass through said control head means; means for transferring at least one of longitudinal and rotational manipulation of said second conduit to said control head means to selectively shift said control head means between closed and open positions; a valve element disposed in said control head means with a central flow way therethrough and a bridge exteriorly on said valve element, said valve element, when in closed position, positioning said bridge within the interior of said cylindrical housing to prevent passage of said plug device therethrough, said valve element, when manipulated to open position, moving said flow way to substantial alignment with said flow passageway to permit fluid transmission through said cylindrical housing and to permit passage of said plug device therethrough; said control head means comprising at least one auxiliary flow passageway ported therethrough and off-set from said central flow way, whereby when said valve element is in closed position, fluid transmitted through said auxiliary flow passageway may enter into said valve element and within said elongated cylindrical housing therebelow, and, when said valve element is in open position, said bridge traverses said auxiliary flow passageway and prevents fluid transmission from said auxiliary flow passageway through said valve element and within said cylindrical housing therebelow; (2) manipulating said second conduit to activate said means for transferring at least one of longitudinal and rotational manipulation to shift said control head means from closed position to open position; and (3) pumping fluid through said second conduit and said apparatus to permit said plug device to be moved through said control head means, out of said apparatus and into said first conduit.

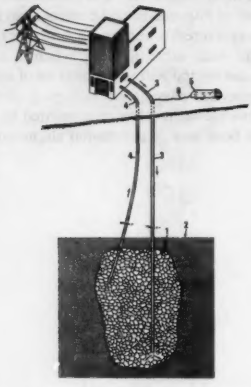


4,345,652

PROCESS FOR IMPROVING THE PERMEABILITY OF GROUND FORMATIONS, ADAPTED TO THE PRODUCTION OF HIGH TEMPERATURE GEOTHERMIC ENERGY

Claude Roque, Chatou, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 24, 1980, Ser. No. 219,606
Claims priority, application France, Dec. 28, 1979, 79 32020
Int. Cl.³ E21B *43/27, 43/28*
U.S. Cl. 166—307 **9 Claims**



1. A process for increasing the permeability of ground formations, adapted to the production of geothermal energy at high temperature, comprising the following successive steps:

(a) injecting a sodium or potassium hydroxide solution during a limited period to effect leaching treatment of the formation;

(b) injecting a saline solution; and

(c) circulating of a heat conveying fluid through the formation. tion.

4,345,653

PACKER DEFLATE SUBASSEMBLY FOR AN INFLATABLE PACKER SYSTEM

Randy S. Baker, Long Beach, and Gerald C. Eckmann, La Puente, both of Calif., assignors to BJ-Hughes Inc., Long Beach, Calif.

Filed Feb. 15, 1980, Ser. No. 121,960
Int. Cl.³ E21B *33/127*
U.S. Cl. 166—317 **7 Claims**

1. An emergency deflation mechanism intended for use in an inflatable packer system adapted for use in a well annulus comprising:

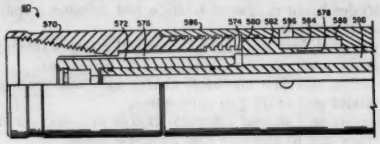
a longitudinally extending fixed cylindrical member adapted to be fixed against axial movement when in position in a well annulus;

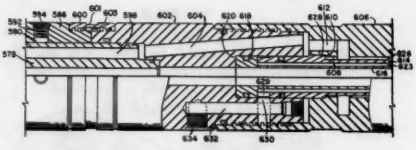
a slidably movable cylindrical member, said slidably movable cylindrical member being adapted for relative movement axially with respect to said fixed cylindrical member;

inflation fluid passage means;

a circumferentially grooved tension sleeve joining said fixed cylindrical member and said slidably movable cylindrical member and adapted to be ruptured when a predetermined tension is applied to said slidably movable cylindrical member;

so that said slidably movable cylindrical member moves axially with respect to said fixed cylindrical member to





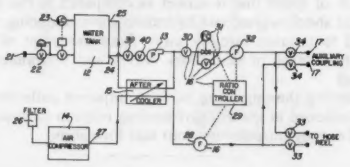
vent inflation fluid from said inflation fluid passage means to the well annulus.

4,345,654

PNEUMATIC ATOMIZING FIRE FIGHTING SUPPLY TRUCK

Stephen C. Carr, 1245 E. 1300 South, Salt Lake City, Utah 84105

Filed Oct. 6, 1980, Ser. No. 194,054
Int. Cl.³ A62C *27/18, 27/28*
U.S. Cl. 169—24 **7 Claims**



1. A fire fighting supply system utilizing pneumatic atomization for extinguishing fires, comprising in combination:

a vehicle having emergency warning devices and storage areas for fire fighting equipment;

a water tank and pump assembly for supplying and pumping water to an aftercooler, and a hose and nozzle assembly;

an air compressor for supplying a pressurized flow of air to the hose and nozzle assembly;

said water operated aftercooler disposed to cool warm compressed air from said air compressor;

manual and automatic ratio flow regulating devices;

said hose and nozzle assembly comprising a live hose reel, a hose, and a nozzle apparatus with a plurality of pneumatic atomizing nozzles.

4,345,655

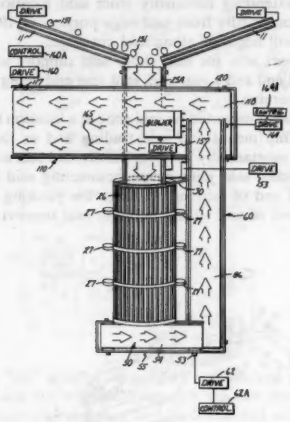
ROCK PICKER WITH STORAGE CONVEYORS

Harley D. Fahrenholz, P.O. Box 278, Clarissa, Minn. 56440

Filed Sep. 24, 1980, Ser. No. 190,373
Int. Cl.³ A01B *43/00*
U.S. Cl. 171—63 **6 Claims**

1. In a rock picker having a longitudinally extending frame, means for lifting rocks or the like from the ground, conveyor means having a longitudinal axis and in position to receive rocks from the means for lifting, the improvement comprising said conveyor means including means to manually control the operation thereof to permit intermittent operation, said con-

veyor means being normally stopped and being operable to move rocks dropped on the conveyor means to different locations along the longitudinal axis thereof such that rocks are stored on the conveyor means at selected locations by selectively operating the conveyor means, said conveyor means including a conveyor frame, upwardly extending side walls on



said conveyor frame, said conveyor frame having one side wall facing the operator at the forward end of the rock picker, and an opening in said side wall member adjacent the discharge end of the conveyor means, means covering the opening effective for preventing rocks from falling through the opening, but permitting the operator to view rocks supported on said conveyor means at the location of the opening.

4,345,656

STRIKING CAP LINING

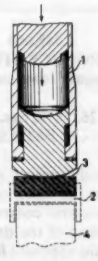
Josef Berzen, Oberhausen, and Herbert Mrozik, Bottrop, both of Fed. Rep. of Germany, assignors to Ruhrchemie AG, Oberhausen, Fed. Rep. of Germany

Division of Ser. No. 918,188, Jun. 19, 1978. This application Dec. 18, 1979, Ser. No. 104,992

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728164

Int. Cl.³ B25D *17/11*; F16F *15/04*

U.S. Cl. 173—131 **5 Claims**



1. A pile-driver comprising a cylinder and a piston, said piston being in registry with a cap disposed over an article to be driven, said cap having a lining in striking relationship with said piston, said lining comprising polyethylene having a viscosimetrically determined molecular weight of 1,000,000 to 10,000,000 and 5 to 40 volume percent of a metal powder.

4,345,657

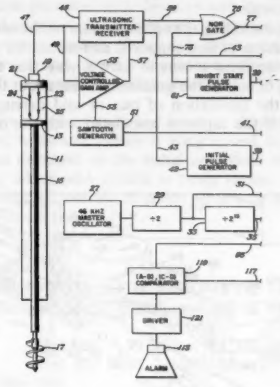
ELECTRONIC DEPTH INDICATOR FOR HYDRAULIC DRILLING MACHINES

Mig A. Howard, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 4, 1979, Ser. No. 81,726

Int. Cl.³ E21B *47/04*

U.S. Cl. 175—40 **6 Claims**



1. A depth determining apparatus for an earth boring machine of the type having a cylinder, a piston carried in the cylinder and longitudinally movable in response to hydraulic fluid pressure, a rotatably driven kelly carried by the piston and adapted to carry a cutting tool, the apparatus comprising:

transducer means mounted at the top of the cylinder for transmitting a sound wave through the hydraulic fluid to the top of the piston and detecting the return of the wave at the top of the cylinder;

counter means for determining the elapsed time for the wave to travel to the piston and back to the transducer means; and

display means for converting the elapsed time into a signal corresponding to the depth of the cutting tool and displaying the signal to the operator.

4,345,658

VEHICLE ABLE TO MOVE BY ADHESION ON A RANDOM SURFACE

Francois Danel, Vendome; Henri Nicollet, Montreuil; Paul Marchal, Gif-sur-Yvette; Marc Robin, Rambouillet, and Jean Vertut, Issy-les-Moulineaux, all of France, assignors to Commissariat A l'Energie Atomique, Paris, France

Filed Sep. 20, 1979, Ser. No. 77,380

Claims priority, application France, Sep. 29, 1978, 78 27905

Int. Cl.³ B62D *57/02*

U.S. Cl. 180—8 C **14 Claims**

1. A vehicle able to move by adhesion on a random surface comprising:

a central body defining a pivoting axis which remains substantially perpendicular to a surface and which has two groups of central supports which adhere to said surface and which are arranged symmetrically with respect to the pivoting axis; first and second carriages, each provided with two groups of adhesive end supports;

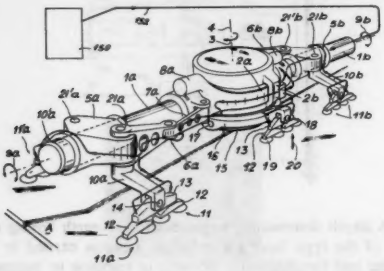
first and second members for guidance in rectilinear translation and without rotation of the first and second carriages in accordance with two directions which remain substantially orthogonal to the pivoting axis, the two groups of end supports associated with a respective carriage being arranged symmetrically relative to a plane containing the rectilinear translation axis and said pivoting axis and connected to the carriage by arms;

displacement means for independently actuating the first and second carriages along the guidance members;

displacement means for pivoting about said pivoting axis the first and second guidance members, the groups of central supports being mounted for rotation relative to said body; means for rotating the groups of central supports about the pivoting axis;

means for bringing about conformity of the position of the pairs of groups of end supports with said surface; in combination with

means for controlling the adhesion state on the surface or the non-adhesion of said supports, and means for controlling the displacement means in such a way that the relative pivoting of one of the guidance means about the pivoting axis or the translation of one of said carriages is only possible if the supports associated with the carriage are



not adhering to the surface and if simultaneously the groups of central supports and those of the other carriage adhere on said surface and in such a way that the displacement in translation of the two carriages relative to the guidance members is only possible if the groups of central supports are disengaged with respect to said surface and the groups of supports associated with the carriages are adhering to the surface.

13. A controllable suction member comprising: a flared skirt made from an elastic material and having a closed bottom and a free edge constituting a deformable lip, a supporting member arranged within said skirt and fixed to said bottom, said member projecting towards the free edge to define a supporting surface made from a material with a high friction coefficient, and means for producing a vacuum within the skirt, said supporting surface being convex and allowing bending of the lip, at a variable angle to accommodate a non-horizontal surface.

4,345,659

AUTOMATIC STEERING MECHANISM FOR SOD PROCESSING MACHINE AND SHOE THEREFOR

William T. Arnold, Sutton West, Canada, assignor to Browwer Turf Equipment Limited, Keswick, Canada

Filed Jul. 10, 1980, Ser. No. 168,820

Int. Cl.³ B62D *1/26*

U.S. Cl. 180—131 **5 Claims**

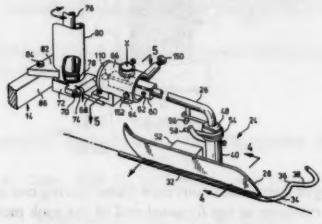
1. In a harvesting apparatus having steering wheels for steering said apparatus, a steering mechanism for steering said wheels, hydraulic power means for driving said steering mechanism, and a hydraulic steering circuit connected to said hydraulic power means for operating said hydraulic power means, an automatic steering mechanism for guiding said apparatus along a path of travel parallel to a cut edge of sod in the ground, said automatic steering mechanism comprising:

(a) an elongated shoe adapted to slide along the ground against said cut edge and to follow said edge, said shoe having a front ramp means which slopes upwardly and forwardly so that said shoe will rise over obstacles in said path of travel, said shoe further having a trailing end,

(b) said shoe comprising an elongated edge rod of substantially circular cross-section adapted to slide along and protrude into said cut edge, a front rod joined to said edge rod and extending outwardly and forwardly in a horizontal plane from said edge rod, away from said cut edge, to a location spaced outwardly of said edge rod, at least one further rod spaced laterally from said edge rod and adapted to slide over the ground and to act as a support runner, said front ramp means extending forwardly from said location and being spaced outwardly from said edge portion, so that said ramp means will not slide along said cut edge,

(c) a support arm for said shoe, said support arm having a forward end and a rear end, said rear end being mounted on said apparatus,

(d) joint means mounted on said shoe at a location between said front ramp means and said trailing end so that said shoe extends substantially both forwardly and rearwardly of said joint means, said joint means connecting said shoe to said forward end of said support arm for pitching and yawing movement of said shoe relative to said support arm,



(e) spring means coupled to said rear end of said support arm and biasing said support arm against said cut edge,

(f) sensing and actuating means connected to said arm for sensing side to side movement of said arm as said shoe follows said cut edge and for producing an actuating signal in response to said side to side movement,

(g) valve means in said hydraulic steering circuit for controlling flow to said hydraulic power means,

(h) said valve means being connected to said sensing and actuating means and being responsive to said actuating signal for operating said power means to steer said steering wheels for said apparatus to follow the path of said shoe,

(i) and feedback means connected to said wheels and coupled to one of said sensing and actuating means and said valve means and responsive to the steering of said wheels in the direction caused by said steering signal to change the condition of said one or said sensing and actuating means and said valve means in a direction to reduce the effect of said actuating signal on said valve means.

4,345,660

VEHICLE EMERGENCY STEERING SYSTEM

Wayne R. Miller, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

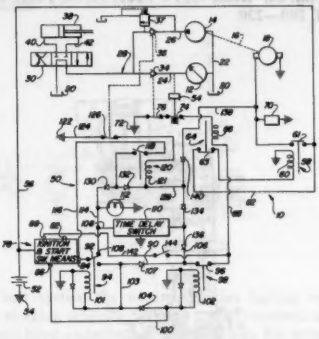
Filed Dec. 26, 1979, Ser. No. 106,831

Int. Cl.³ B62D *5/006*

U.S. Cl. 180—133 **3 Claims**

1. In a vehicle hydraulic power steering system including main and backup pumps, an electrically responsive drive for the backup pump and electric control circuitry for automatically effecting energization of the drive upon a failure of the main pump to output fluid adequate for normal steering operation and a test circuit between an "on" contact of a vehicle ignition and start switch means and the control circuitry to energize the electrically responsive drive when the switch means is placed in an "on" position before starting the vehicle, and said test circuit including a time delay switch which interrupts current flow through the test circuit a predetermined period after being energized, the improvement comprising: an electrically responsive backup pump failure indicating device;

a first lead connecting said device to said "on" contact; a normally open switch connected to said first lead; means for closing said normally open switch; a second lead connecting said closing means to said time delay switch; a normally closed backup pump failure sensing switch serially connected with said closing means and said time delay switch whereby said closing means is actuated to close said normally open switch



when said "on" contact is engaged, said backup pump is not operating and said time delay switch has not timed out; said normally open switch being serially connected with said closing means and said backup pump failure sensing switch whereby a failure of the backup pump to operate satisfactorily when the electrically responsive drive is being tested will be indicated by the continued energization of the failure indicating device, after the time delay switch has timed out.

4,345,661

ANTI-ROLL SYSTEM FOR VEHICLES

Masao Nishikawa, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

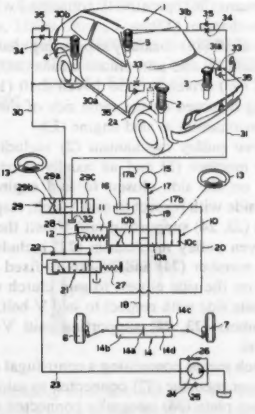
PCT No. PCT/JP79/00098, § 371 Date Feb. 8, 1980, § 102(e) Date Feb. 5, 1980, PCT Pub. No. WO80/00017, PCT Pub. Date Jan. 10, 1980

PCT Filed Apr. 17, 1979, Ser. No. 190,865

Claims priority, application Japan, Jun. 8, 1978, 53/69097

Int. Cl.³ B60G *21/006*

U.S. Cl. 180—141 **8 Claims**



1. An anti-roll system for a vehicle equipped with a power steering system including a hydraulic pressure reaction chamber for producing a steering reactive force, and means for modulating said steering reactive force by the speed at which the vehicle is moving, said system comprising:

damper means having at least a cylinder and a piston, said damper means being disposed between the vehicle body and each of the vehicle wheels;

said damper means being in fluid communication with said hydraulic pressure reaction chamber in said power steering system;

means for selectively connecting said hydraulic pressure reaction chamber with those of said damper means disposed on either side of said vehicle in response to rotation of a steering wheel of said vehicle in a selected steering direction, said means being connected between said hydraulic pressure reaction chamber and said damper means; and

the hydraulic pressure in said reaction chamber being introduced, while said vehicle is being turned, into said damper means disposed on the radial outermost side of a circle along which said vehicle is being turned, depending on said selected steering direction, so as to control the roll of the vehicle body.

4,345,662

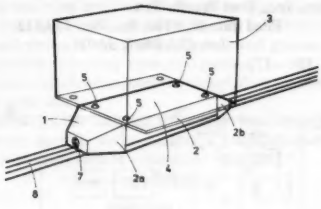
INSTALLATION WITH AUTOMATIC VEHICLES

Michel Deplante, Paris, France, assignor to MATRA, Paris, France

Filed Dec. 7, 1979, Ser. No. 101,336

Int. Cl.³ B60T *7/16*; B62D *1/28*

U.S. Cl. 180—168 **7 Claims**



1. An installation for transporting loads automatically along a predetermined path extending through corridors or the like, which path includes stops, junctions, crossings, inlets, and outlets for vehicles traveling along said path, said installation comprising an optical track laid along the ground to define said path, said optical track consisting of an extended, optically detectable central track section which is bounded along its two opposing edges respectively by a pair of optically detectable lateral track sections, said central and lateral track sections having optical characteristics which are different from one another respectively; and at least one vehicle adapted to be guided along said track, said vehicle comprising a substantially rectangular frame having load support means thereon, said vehicle further comprising four steerable ground-engaging wheels located at the four corners of said frame respectively, said four wheels being interconnected to one another by linkages arranged to cause the positions of said four steerable wheels to change in unison, said vehicle also comprising a motor for driving a single ground-engaging driving wheel which is centrally located along the main axis of said frame, and control means carried by said vehicle for controlling the positioning of said four steerable wheels and the operation of said driving wheel, said control means comprising ultrasonic emitter-receiver means located adjacent an end of said vehicle and oriented forwardly of said vehicle for detecting the presence of obstacles forward of and along the path of movement of said vehicle, and said control means further including at least two light emitter-light receiver assemblies carried by said vehicle and oriented downwardly of said vehicle toward said optical track, said two emitter-receiver assemblies being later-

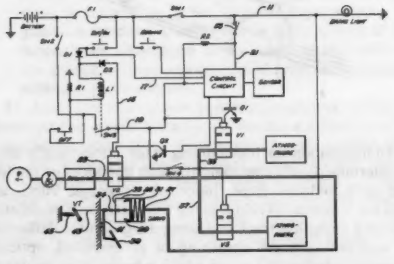
ally spaced from one another and being positioned respectively to overlap one of the elongated boundary edges between said central track section and one of said lateral track sections respectively, the emitter in each said assembly being operative to emit light toward its associated elongated boundary edge in said track and the receiver in each said assembly being operative to receive optical signals from the portions of said track which are illuminated by said emitters, the receiver in each of said assemblies being operative to produce an output signal which is a function of the lateral position of said assembly relative to the boundary edge between said central track section and the associated one of said lateral track sections as said vehicle travels along said track, and circuit means responsive to the sum and difference of the two signals provided by the two receivers in said assemblies for simultaneously determining that said difference is substantially null and that said sum is substantially the double of an average value, said circuit means being operative to control the positioning of said four steerable wheels and being operative to control said motor of said vehicle when the difference between said two signals is not null in average.

4,345,663

SPEED GOVERNOR WITH DUAL SAFETY SYSTEM

Neal G. Shields, Fort Worth, Tex., assignor to Specific Cruise Systems, Inc., Fort Worth, Tex.

Filed Jul. 18, 1980, Ser. No. 170,112
Int. Cl.³ B60K *31/00*
U.S. Cl. 180—177 **10 Claims**



1. In a motor vehicle speed governor of the type having servo means for moving the throttle, accelerator means for causing the servo means to advance the throttle, decelerator means for causing the servo means to release the throttle, control means for controlling the accelerator means and decelerator means in response to vehicle speed, and power means for energizing the control means, the improvement comprising:

brake switch means, connected into a brake line extending between a brake fuse and a brake light, for signalling the control means to actuate the decelerator means when a brake pedal is depressed;

safety means for causing the servo means to release the throttle independent of the positions of the accelerator means and decelerator means, the safety means being connected into a safety line that extends from the power means to a point in the brake line between the brake switch means and the brake light; and

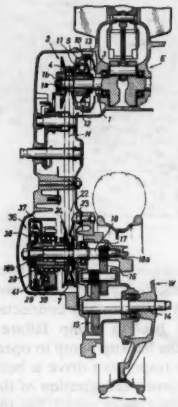
safety switch means connected in the safety line for opening the safety line when the brake pedal is depressed to cause the safety means to release the throttle.

4,345,664

POWER TRANSMISSION FOR TWO-WHEELED VEHICLE

Nobuo Anno, Urawa; Haruki Okui, Wako; Kuniyuki Yamamoto, Kodaira, and Kunio Miyazaki, Oimachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1980, Ser. No. 151,622
Claims priority, application Japan, May 23, 1979, 54-63642
Int. Cl.³ B60K *41/14*; F16H *55/56*; F16D *43/14*
U.S. Cl. 180—230 **14 Claims**



1. A power transmission for a two-wheeled motorcycle, comprising:

(a) an engine (E);

(b) a drive shaft (1) driven by said engine (E);

(c) a variable-diameter drive pulley mechanism (2) connected to said drive shaft (1);

(d) a variable-diameter driven pulley mechanism (22);

(e) a V-belt (7) extending around said drive and driven pulley mechanisms (2, 22) for operative connection therebetween;

(f) clutch means (36) operatively connected with said driven pulley mechanism (22);

(g) a driven shaft (18) coaxially supporting said driven pulley mechanism (22) and said clutch means (36);

(h) a wheel (W) driven by said driven shaft (18), said wheel (W) being disposed on the same side of the power transmission mechanism as said engine (E);

(i) said drive pulley mechanism (2) including an axially movable member (5) and an axially fixed member (4), disposed on the side closest to said engine and on the opposite side with respect to said V-belt, respectively, said members (23, 24) supporting said V-belt therebetween;

(j) said driven pulley mechanism (22) including an axially movable member (24) and an axially fixed member (23), disposed on the side closest to said clutch means and on the opposite side with respect to said V-belt, respectively, said members (23, 24) supporting said V-belt therebetween; and

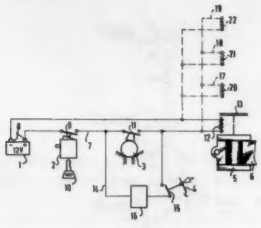
(k) said clutch means comprising a centrifugal clutch including an outer member (37) connected to said driven shaft, and a drive plate (38) integrally connected to said driven pulley mechanism, said drive plate (38) including an element for frictionally engaging said outer member (37) upon actuation of said element under centrifugal forces.

4,345,665

SAFETY BELT SYSTEM FOR MOTOR VEHICLES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 181,109
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934749
Int. Cl.³ B60R *21/00*
U.S. Cl. 180—270 5 Claims



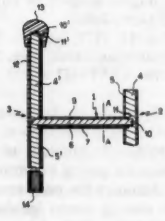
1. Safety belt system for motor vehicles having vehicle batteries and steering wheel locks with a safety-current circuit which does not have a seat switch in the circuit, for activating the safety belt system during the time when motion of the vehicle can occur, which comprises a safety belt with one end of the belt extending into an automatic roll-up device, locking means in the automatic roll-up device for locking the safety belt, activating means which when energized by an electric current will cause said locking means to lock the safety belt, an electric safety current circuit connected to the vehicle battery for passage of electric current to energize said activating means, a first switch in the circuit operated in conjunction with the steering wheel lock, said first switch closed by unlocking the steering wheel lock to provide for current flow in the circuit and permit movement of the vehicle, a second switch in the circuit which normally is in the open position, said first switch and said second switch connected in series in said circuit, and a sensor device which effects closing of said second switch when a predetermined deceleration of the vehicle is exceeded whereby electric current flows through the circuit from the battery to energize the activating means and cause the locking means to lock the safety belt.

4,345,666

SOUND-DAMPING ASSEMBLY FOR A STRUCTURE OF A PIECE OF FURNITURE

Marcel Mathou, 12630 Gages, France

Filed Oct. 23, 1980, Ser. No. 200,055
Claims priority, application France, Nov. 7, 1979, 79 27502
Int. Cl.³ F16F *15/00*
U.S. Cl. 181—207 12 Claims



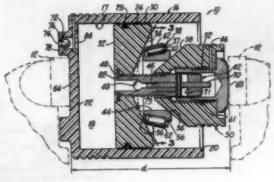
1. A sound-damping structure assembly for use as a structural component of a piece of furniture, which comprises a first elongated structural member and a second sheathing member having substantially the same length as said first member and surrounding same, wherein said second member is made out of a rigid or semi-rigid material, said first and second members having, in cross-section, relative outer and inner contours, respectively, whereby in assembled relationship a damping air cushion is formed on the major portion of the interface between said outer contour of said first member and said inner contour of said second member.

4,345,667

METHOD AND APPARATUS FOR INJECTING VISCOUS MATERIALS

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Filed Jan. 24, 1980, Ser. No. 115,062
Int. Cl.³ F01M *11/00*; F16N *3/10*
U.S. Cl. 184—1 D 4 Claims



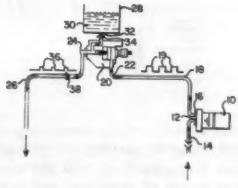
1. An assembly for greasing an article comprising:
a housing defining an internal chamber including a first open end;
a piston slideably insertable into said chamber;
a lubricant receiving aperture in said piston adapted to direct grease from below said piston upwardly into said article when said piston is compressed against said grease;
a stem centrally extending from said piston;
a compression application member adapted to be mounted on said stem; and
an extension member adapted to engage said compression application member for increasing a longitudinal dimension of said compression application member.

4,345,668

VERY LOW FLOW RATE LUBRICANT METERING APPARATUS AND METHOD FOR A TOOL AND WORKPIECE

Frank L. Gaunt, 6922 - 113th Court St. East, Puyallup, Wash. 98371

Filed Jul. 7, 1980, Ser. No. 166,404
Int. Cl.³ F16N *13/16*
U.S. Cl. 184—29 20 Claims



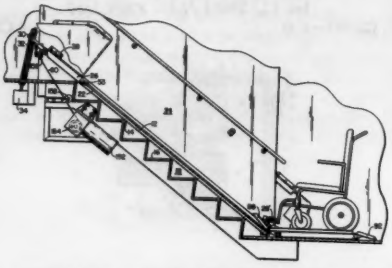
14. A precision, very low flow rate lubricant metering apparatus for lubricating a tool and workpiece during machining operations, comprising means for substantially continuously, during operation, delivering lubricant to an output, for delivery to a tool and workpiece during machining operations, at a very low flow rate of less than about 10 cubic centimeters per minute, wherein the lubricant is of the type which permits said machining operations to take place at said very low flow rate without substantially reducing the cutting action between the tool and workpiece, and without substantially reducing the life of the tool; thereby eliminating the need for special cooling

techniques such as the use of liquid fluorocarbon coolants and the use of high lubricant flow rates for cooling purposes.

4,345,669
WHEELCHAIR LIFT

Kenneth L. Noall, Ogden, Utah, assignor to Abex Corporation, New York, N.Y.

Filed Sep. 5, 1980, Ser. No. 184,509
Int. Cl.³ B66B *9/06*
U.S. Cl. 187—10 **14 Claims**

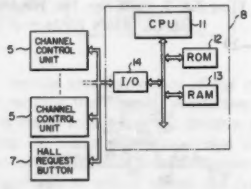


1. A lift for moving a wheelchair over a stairway from a lower floor to an upper floor including a ramp, a carriage mounted adjacent the ramp, a wheelchair supporting platform attached to the carriage, means for moving the carriage and platform along the ramp, characterized by means for pivoting the ramp between a first position in which the ramp rests horizontally on top of the stairway and a second position in which the ramp is stored substantially vertically beside the stairway and intrusion of the ramp into the stairway is minimized.

4,345,670
ELEVATOR CONTROL SYSTEM

Takashi Kaneko, and Tatsuo Iwasaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1981, Ser. No. 222,767
Claims priority, application Japan, Jan. 7, 1980, 55-125
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **12 Claims**

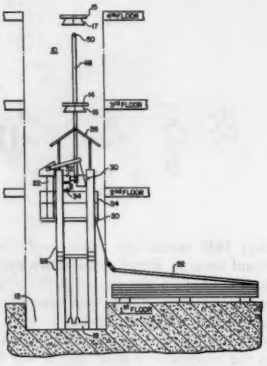


1. An elevator control system comprising;
at least one elevator for serving to a plurality of floors,
a control unit for controlling said elevator in accordance with a first group of programs and a second group of programs to impart a plurality of functions to said elevator,
a fault detection means for detecting a fault occurred in the control operation by said control unit,
a first fault processing means for stopping the control by said control means when the fault detected by said first detection means is due to the operation related to a program of said first group, and
a second fault processing means for removing the control by a program causing the fault when said program causing the fault is in said second group.

4,345,671
APPARATUS AND METHOD FOR INSTALLING ELEVATOR GUIDE RAILS

Larry P. Tosato, Millburn, N.J.; Henry A. Wehrli, Monroeville, Pa., and Robert C. Stewart, deceased, late of Morris, N.J. (by Dorothy M. Stewart, executrix), assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 12, 1980, Ser. No. 129,531
Int. Cl.³ B66B *7/02*
U.S. Cl. 187—95 **12 Claims**



1. A system for installing elevator guide rails in a hoistway constructed of guide rail sections, comprising:
a plurality of wall brackets located in vertical alignment along said hoistway;
a plurality of guide funnels detachably mounted to said wall brackets;
means for pushing said guide rail sections up said hoistway through said guide funnels;
guide means detachably mounted to the first guide rail section pushed up said hoistway for smoothly guiding said guide rail section through said plurality of guide funnels;
means for retaining said guide rail sections in said hoistway; and
means for aligning a guide rail section colinearly with said guide rail sections retained in said hoistway such that said aligned guide rail section may be connected to said guide rail sections retained in said hoistway to provide said vertically straight guide rail.

4,345,672
ALARM DEVICE FOR A BRAKE CLEARANCE LIMIT IN AN AIR-OVER-HYDRAULIC BRAKE SYSTEM

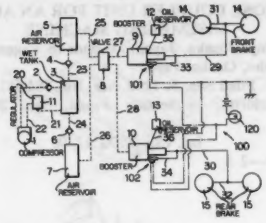
Kei Nakasu, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 11, 1979, Ser. No. 74,713
Claims priority, application Japan, Dec. 29, 1978, 53-165192
Int. Cl.³ F16D *66/00*
U.S. Cl. 188—1.11 **13 Claims**

1. In an air-over-hydraulic brake system, wherein an air pressure piston actuated by pressurized air drives a hydraulic piston to produce hydraulic pressure in a hydraulic brake system, an alarm device for giving a warning when a permissible limit of a brake clearance has been reached comprising:
hydraulic pressure sensing means for detecting a hydraulic pressure P in said hydraulic brake system;
shift amount sensing means for detecting a shift amount l of said air pressure piston, at a brake operation time just when said permissible limit of the brake clearance has been reached, from a position where the brake clearance has just been lost; and

warning means for warning a driver of a vehicle when a formula

$$l > \alpha \cdot P$$

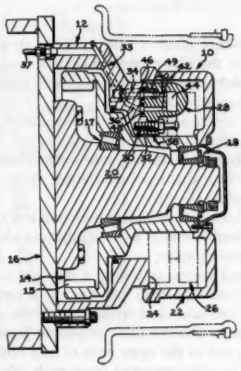


has become to be satisfied, wherein α is an expansion constant of said hydraulic brake system which is a quotient of the increased shift amount of said hydraulic pressure piston after the disappearance of the brake clearance divided by the increased amount of the hydraulic pressure.

4,345,673
WHEEL BRAKE ARRANGEMENT

William I. Callaghan, and Charles P. Ehinger, both of Mentor, Ohio, assignors to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/00269, § 371 Date Mar. 13, 1980, § 102(e) Date Mar. 13, 1980, PCT Pub. No. WO81/02550, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 13, 1980, Ser. No. 201,092
Int. Cl.[3] B60T *1/06;* F16D *51/00*
U.S. Cl. 188—18 R 9 Claims



1. In a wheel brake arrangement (10) having a frame (16), a wheel gear housing (12) adjacent the frame (16), an annular rotating brake drum member (22) adjacent one end (24) of the wheel gear housing (12), the annular rotating drum member (22) being mountable to a surrounding wheel hub, a radially expandable brake shoe friction member (26) intermediate the wheel gear housing (12) and the rotating brake drum member (22) and means (28) for fluid pressure motivating of the friction brake shoe member (26) to expand radially into frictional engagement with the rotating brake drum member (22), the improvement comprising:

means (30) for mounting said motivating means (28) in abutting relation directly to said one end of said wheel gear housing (12) without the interposition of a backing plate between said motivating means (28) and said wheel gear housing (12);

said wheel gear housing (12) defining a passage (33);

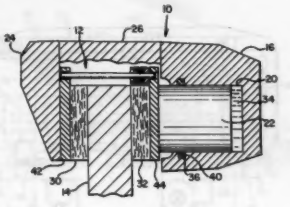
means for rigidly connecting the wheel gear housing (12) to the frame (16); and

means (38) for connecting said passage (33) with said motivating means (28).

4,345,674
DISC BRAKE PAD RETRACTOR

Dusan M. Vacval, Buffalo Grove, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Sep. 29, 1980, Ser. No. 191,557
Int. Cl.[3] F16D *65/38*
U.S. Cl. 188—71.8 6 Claims



1. A disc brake system for braking a rotatable disc brake rotor comprising:

a selectively actuable caliper assembly disposed about said rotor;

a pair of lining carriers carried by said caliper assembly respectively on opposite sides of said rotor, each lining carrier having a brake pad in confronting relation to said rotor and having an axial aperture, said apertures being axially aligned; and

a disc brake wear compensator and retractor assembly including a retractor rod carried in said apertures of said lining carriers, a cup shaped retractor housing slidably displaced on said retractor rod one of said lining carriers abutting said retractor housing and adapted to displace said retractor housing on said rod, a wear compensating resistance member disposed within said retractor housing and slidably mounted on said rod with an interference fit therebetween, said resistance member being slidably displaced by said retractor housing along said retractor rod when the displacement of said retractor housing on said retractor rod exceeds a predetermined distance, and spring means being disposed within said retractor housing between said retractor housing and said resistance member and being disposed to bias said retractor housing away from said resistance member said predetermined distance and said lining carrier and brake pad away from said rotor.

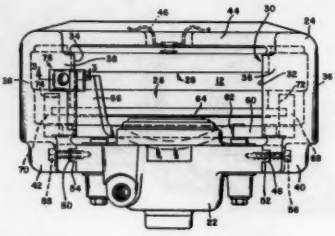
4,345,675
DISC BRAKE ASSEMBLY WITH LIGHTWEIGHT AND SPACE SAVING CHARACTERISTICS

Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 6, 1980, Ser. No. 127,708
Int. Cl.[3] F16D *65/02*
U.S. Cl. 188—73.43 1 Claim

1. A disc brake assembly with space saving characteristics comprising a torque plate (14) fixedly disposed relative to a rotor (12) to be braked, a caliper assembly (20, 22, 64) movably carried by the torque plate (14), a pair of friction elements (26, 28) cooperating with the caliper assembly (20) to frictionally engage the rotor (12) during braking, the caliper assembly (20, 22, 64) including a central opening (30) forming abutment surfaces (32, 34) the torque plate (14) including a first portion (60) parallel with the rotor (12) and extending into the central opening (30) to engage the abutment surfaces (32, 34) and a second portion (66) perpendicular to the rotor (14) and dis-

posed substantially within the central opening (30), characterized by said torque plate first portion (60) defining a cut out (62) opening radially outwardly to receive a portion of said caliper assembly (22, 64) and also separating said first portion (60) into a pair of radially extending sections (61, 63) disposed within the central opening (30), said torque plate second portion (66) extending axially from only one of said radially extending sections to engage one of the abutment surfaces (32, 34) thereby preventing rotation of the caliper assembly in one direction, said torque plate second portion (66) comprising the only part of the torque plate extending perpendicularly within the central opening, said caliper assembly (20, 22, 64) including axially extending flanges (36, 38) overlaying said rotor (12),



each of said flanges defining an arcuate width (A) which is larger than an arcuate width (B) defined by the entire portion of said torque plate second portion extending perpendicularly within the central opening (30), and said flanges (36, 38) having a radial dimension which is substantially equal to a radial dimension for said torque plate second portion (66), whereby the forces transmitted from one of said flanges (38) to said torque plate second portion (66), will be spread over a larger volume of material for said one flange (38) than said torque plate second portion (66), while at the same time maintaining the radial dimension for said one flange (38) substantially equal to the radial dimension for said torque plate second portion (66) to accommodate space limitations for the disc brake assembly.

4,345,676

FRICTION CLUTCH DRIVEN PLATES

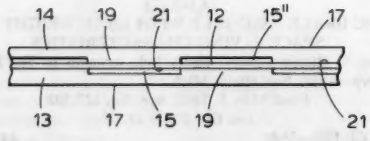
Roger P. Jarvis, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Mar. 28, 1980, Ser. No. 135,093

Claims priority, application United Kingdom, Apr. 4, 1979, 7911750

Int. Cl.³ F16D *13/64*

U.S. Cl. 192—107 C **8 Claims**



1. A friction clutch driven plate comprising:

an annular friction facing having a friction surface and a back face;

a rigid annular support plate having an opposed annular surface in contact with said back face; and

circumferentially spaced recesses are provided in the opposed adjacent surfaces of the facing and the support plate to relieve the back face of the facing so as to allow the friction surface portions of the facing to yield under axial load on engagement of the driven plate against a drive member.

4,345,677

CHUTE-HOSE COUPLER UNIT FOR AN AUTOMATIC ASSEMBLING MACHINE

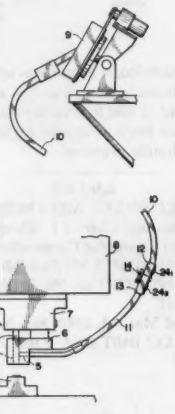
Katsumi Shinjo, Osaka, Japan, assignor to Yugen Kaisha Shinjoseisakusho, Osaka, Japan

Filed Sep. 5, 1980, Ser. No. 184,601

Claims priority, application Japan, Sep. 28, 1979, 54-135667[U]

Int. Cl.³ B65G *11/00*

U.S. Cl. 193—2 A **1 Claim**



1. A chute-hose coupler unit used for an automatic assembling machine, the unit comprising:

a first coupler adapted to be detachably connected to an end of a first chute-hose;

a second coupler adapted to be detachably connected to an end of a second chute-hose;

said first coupler including a first leaf spring which has its free flexible end at a point adjacent to the open end of said first coupler;

said second coupler including a second leaf spring which has its free flexible end at a point adjacent to the open end of said second coupler;

said each leaf spring including a stop pin in its free flexible end portion, said stop pin having a tendency of being inserted into said chute-hoses under the urge of said leaf springs so as to block the component parts therein against dropping out of the open ends of said couplers when said couplers are disconnected from each other;

said first coupler including a first cam means adapted to slide under said second leaf spring; and

said second coupler including a second cams means adapted to slide under said first leaf spring.

4,345,678

ROLLER CONVEYORS

David M. Garnett, Thorpe Arch Trading Estate, Wetherby, Yorkshire, England (LS23 7BL)

Filed Dec. 26, 1979, Ser. No. 107,200

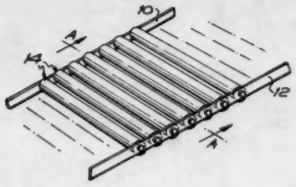
Claims priority, application United Kingdom, Sep. 7, 1979, 7931143

Int. Cl.³ B65G *39/09*

U.S. Cl. 193—35 R **13 Claims**

1. A roller for a roller conveyor, said roller comprising a sleeve body receiving roller bearings in the ends thereof, at least one of the bearings comprising an inner race and an outer race of which one is in operative connection with the sleeve

body, whilst the other is mounted on spindle means, and the race which is in operative connection with the spindle means is in use stationery and receives the spindle means with clearance, the bearing including a flexible seal positioned between said race and said spindle sealing the said race to the spindle but allowing at least limited relative axial movement of the spindle means and said race.

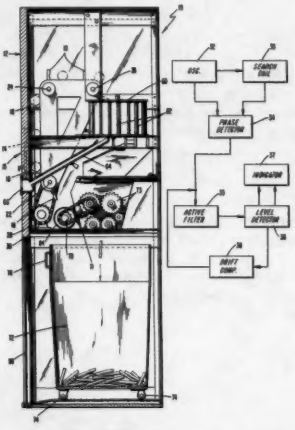


4,345,679

CONTAINER COLLECTION APPARATUS WITH ELECTROMAGNETIC SENSOR AND METHOD

Bruce H. DeWoolfson, 2200 Columbia Pike, #1113, Arlington, Va. 22204

Filed May 9, 1980, Ser. No. 148,371
Int. Cl.³ G07F *07/06*
U.S. Cl. 194—4 C **14 Claims**



1. Apparatus for collecting and storing empty aluminum containers and issuing payment for containers collected, comprising:

preselection means for exposing a crushed or non-crushed container offered by a customer to an electromagnetic field for identifying whether said container is substantially aluminum without establishing direct electrical contact with said container, said preselection means including a container access area configured to accomodate both crushed and non-crushed containers for exposure to said field;

means for accepting only a container identified by said preselection means as being substantially aluminum, independent of the configuration of said container;

coin-dispensing means responsive to said preselection means for dispensing coins in return for containers having a substantially aluminum composition;

means cooperating with said accepting means for crushing said containers; and

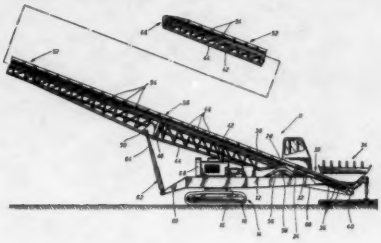
means for storing crushed containers received from said crushing means.

4,345,680

MATERIAL TRANSFER APPARATUS

Franklin J. Kay, 2103 Place Rebecca D-3, Houston, Tex. 77068

Continuation of Ser. No. 912,198, Jun. 5, 1978, abandoned. This application Aug. 22, 1980, Ser. No. 180,433
Int. Cl.³ B65G *41/00*
U.S. Cl. 198—304 **22 Claims**



1. An apparatus for transferring material, e.g. overburden, comprising:

lower support means;

a frame rotatably mounted to said support means about a vertical axis;

means defining a hopper supported by said frame and having at least a portion thereof in horizontal spaced relation to said support means and outwardly from said vertical axis;

a conveyor mounted to said frame and extending to a discharge end, said conveyor communicating with said hopper for receiving material therefrom and conveying the material to the conveyor discharge end, at least a portion of said conveyor being mounted for pivoting about a horizontal axis on said frame that is spaced apart from said vertical axis and is located between said vertical axis and the end of said conveyor which communicates with said hopper; and

means for pivoting said conveyor portion about said horizontal axis to adjust the elevation of the conveyor discharge end;

whereby, in operation, the horizontally displaced hopper portion facilitates the maintenance of the apparatus center of gravity within the area defined by said support means.

4,345,681

ELEVATOR

Victor Vinson, 6 Barnwell, Peterborough, England (PE85PH)

Filed Sep. 17, 1980, Ser. No. 188,038
Int. Cl.³ B65G *15/14, 19/00*
U.S. Cl. 198—626 **20 Claims**

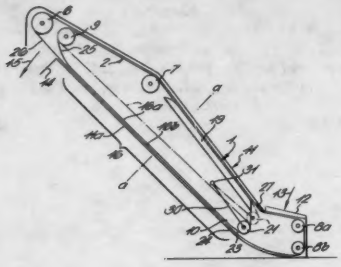
1. An elevator comprising:

a pair of continuous entrainments mounted one within the other and at least a section of one entrainment lying adjacent a corresponding section of the other, at least the outer entrainment being perforate to enable material being transported to pass therethrough;

drive means for driving said entrainments simultaneously; and,

a support for the entrainments including means which extend alongside said corresponding sections of the entrainments and which define an inlet and an outlet, said means retaining the material which is transported by said sections from the inlet to the outlet when said sections are elevated and when said entrainments are driven, said support enabling floating movement of a lower end portion of said inner entrainment relative to said outer entrainment and thereby enabling relative movement be-

tween said sections of the inner and outer entrainments whereby the spacing between said sections varies to accommodate the material transported from the inlet to the outlet.

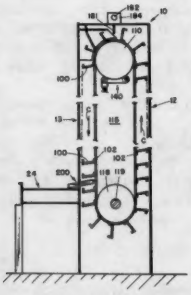


4,345,682

EGG TRANSPORTING SYSTEM

Charles A. White, Woodstock; Jerome J. Kennedy, Marietta, and Harold S. Wayne, Douglasville, all of Ga., assignors to U.S. Industries, Inc., New York, N.Y.

Division of Ser. No. 114,341, Jan. 22, 1980, Pat. No. 4,293,066.
This application Apr. 16, 1981, Ser. No. 254,783
Int. Cl.³ B65G *17/30*
U.S. Cl. 198—635 **5 Claims**



1. In an egg transferring elevator including endless loop conveying means extending generally vertically and including egg carrying cradles having spaced fingers with a first surface for carrying eggs in an upward direction on one side of said elevator and a second surface for carrying eggs in a downward direction whereby eggs are shifted from said first surface of a cradle to said second surface of an adjacent cradle as the cradles travel over an upper end of said elevator, said endless loop conveying means mounted in a frame, means for slowing the transfer of egg from one cradle to another at the upper end of said elevator comprising:

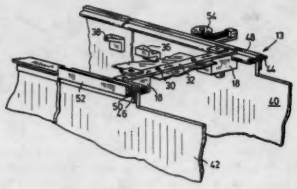
a plurality of downwardly projecting resilient fingers spaced from one another and mounted to said frame at said upper end in the area where the transfer of eggs from one cradle to another occurs and extending into the space between fingers of said cradles to releasably engage eggs as they fall from one cradle to another thereby slowing and cushioning such transfer of eggs.

4,345,683

CONVEYOR FOR LABELLING APPARATUS

George B. Pfeffer, Minnetonka, Minn., assignor to Datafile Limited, Willowdale, Canada

Filed Apr. 28, 1980, Ser. No. 140,816
Int. Cl.³ B65G *47/86*
U.S. Cl. 198—653 **15 Claims**



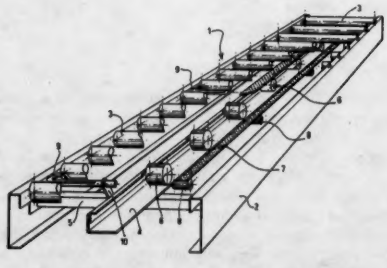
1. In apparatus for labelling sheet material, a conveyor comrising a plurality of pairs of clamps secured to a looped endless carrier, the clamps of each pair of clamps being spaced apart transversely of said carrier and secured along respective sides of said carrier, each clamp of said pair having means for biasing said clamp to a closed position and means for holding said clamp in its open position, means to each carrier side for opening said pairs of clamps in their held-open position and means to each carrier side for releasing said pairs of clamps from their held-open position to close said clamps under pressure of said biasing means to grip sheet material which has been placed on said conveyor and hold it while being labelled, said holding means including a catch where said means for opening said clamps and said means for closing said clamps exert forces on each pair of said clamps which are laterally directed relative to said carrier toward one another or away from one another in opening and closing said clamps to balance thereby forces on said carrier and maintaining carrier alignment during opening and closing of each pair of clamps.

4,345,684

ACCUMULATOR CONVEYOR

Guy Rolland, Viry Chatillon, France, assignor to Societe Mecanique Generale et Decolletage Tournage, Evry Cedex, France

Filed Jul. 28, 1980, Ser. No. 173,126
Claims priority, application France, Jul. 30, 1979, 79 19607
Int. Cl.³ B65G *13/06*
U.S. Cl. 198—781 **3 Claims**



1. An accumulator conveyor for intermittent loads comprising a frame, a transport surface defined by carrier rollers for bearing and displacing the loads; at least one drive belt in continuous displacement under said carrier rollers and adapted to be brought into friction drive relation with respect thereto; pressure rotors having eccentric axes of rotation supporting said drive belt and adapted to urge said drive belt against said carrier rollers; load sensing means disposed at spaced locations along the transport surface between adjacent carrier rollers;

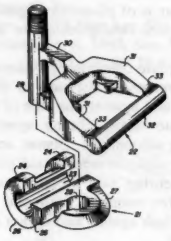
the improvement comprising each of said pressure rotors having a housing with an outer wall of generally cylindrical configuration rotatably mounted about an eccentric axis; at least one pressure roller rotatably mounted inside each of said rotor housings; the outer wall of each of said rotor housings having two angularly spaced apertures through which the outer surface of its associated pressure roller protrudes, said apertures both being located on one side of a diametrical plane containing the axis of rotation of its associated pressure rotor.

4,345,685

CHAIN DRIVEN CONVEYOR BELTS

Edward J. Horkey, 835 W. 22nd St., Suite C, Tempe, Ariz. 85282

Filed Jul. 25, 1980, Ser. No. 172,142
Int. Cl.³ B65G *17/06, 17/38*
U.S. Cl. 198—852 **12 Claims**



1. A link for a drag chain comprising:
a supporting surface,
support arms extending rearwardly from said supporting surface,
a connecting bar formed integral with the free ends of said support arms, and
an attachment pin extending laterally from said supporting surface substantially perpendicular to said connecting bar, and
means comprising a part of said pin for use in attaching the link to the surface of a flat belt conveyor.

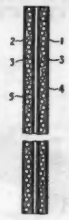
4,345,686

MATERIAL FOR FIXING ANCHOR BOLT OR LIKE AND METHOD OF MANUFACTURING SAME

Takeshi Sato, 7-10, Kikusui-cho, 5-chome, Hyogo-ku, Kobe, Hyogo-ken 652; Hiroji Tada, 1183-1, Mega-Asahi-cho, Shikama-ku, Himeji-shi, Hyogo-ken 672, and Yoshiichi Yano, 1-10-504, Tsurukabuto 4-chome, Nada-ku, Kobe, Hyogo-ken 657, all of Japan

PCT No. PCT/JP79/00147, § 371 Date Apr. 16, 1980, § 102(e) Date Jul. 5, 1979, PCT Pub. No. WO80/02707, PCT Pub. Date Dec. 11, 1980
PCT Filed Jun. 8, 1979, Ser. No. 192,951
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—219 **6 Claims**

1. A material for fixing an anchor bolt or the like, comprising a plurality of pairs of first and second members having crushable tube envelopes formed of a frangible material, respectively, and being arranged along a cylindrical surface to form a tubular structure having a central cavity, the envelope of said first member being filled with artificial solid ball-like aggregates and paste-like base material of cold-setting resin requiring hardener, the envelope of said second member being filled with artificial solid ball-like aggregates and paste-like hardener for said resin, said first and second members being adhered mutually with adhesive, and the outer diameters of said members



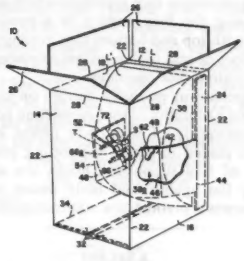
being selected to adapt the outer diameter of said tubular structure for a predetermined planting hole.

4,345,687

COLLAPSIBLE HEADLAMP CARTON AND BLANK FOR FORMING SAME

Thomas L. Davidson, Uncasville, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Jan. 15, 1981, Ser. No. 225,327
Int. Cl.³ B65D *85/42*
U.S. Cl. 206—418 **13 Claims**

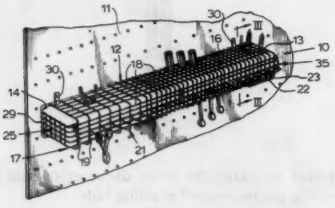


1. In a collapsible carton constructed from a single blank and adapted to contain and retain an automobile headlamp of the type including a series of at least four panels hinged together to form a rectangular tube, a glue flap hinged to the free side edge of the panel at one end of the series for adherence to the free side edge of the panel at the other end of the series to maintain the integrity of the tube; cover flaps hinged to the opposite free edges of the wall panels for closing off the open ends of the tube; the improvement comprising a lamp-retaining strap inside the carton, said strap including a pair of similar panels hinged at corresponding edges thereof to opposite carton wall panels, a bridging panel hinged at its opposite edges to free edges of said pair of panels so as to extend between said opposite carton wall panels, a strap reinforcing panel hinged to a free edge of said bridging panel perpendicular to its hinged connections to said pair of panels, said reinforcing panel having substantially the same dimensions as the bridging panel so that it can be folded along its said hinge line flush against said bridging panel, and means for adhering the reinforcing panel to the bridging panel to form a two-ply strap segment extending between said pair of panels so that when a headlamp is inserted into the carton and engaged under said strap, said strap has little tendency to tear.

4,345,688
TOOL HOLDER DEVICE

Albert De Boer, 18851 Wildwood Ave., Lansing, Ill. 60438

Filed Jul. 18, 1980, Ser. No. 169,938
Int. Cl.³ A47F 5/01
U.S. Cl. 211—60 T 8 Claims



1. A tool holder device for storing hand tools in an organized, accessible and compact manner comprising:

an elongated body means having longitudinal top and bottom faces thereon with each of said faces being formed of a grating having tool receiving openings therein whereby said top face grating is adapted to support certain hand tools in an upright pendent orientation and whereby said bottom face grating is adapted to stabilize depending portions of said hand tools extending through said bottom face openings;

a mounting means for securing said elongated body to a mounting surface;

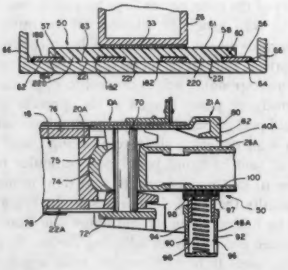
a longitudinal support plate secured to said body and underlying a portion of said bottom face being adapted to support on end certain tool members which are not supportable by said top face grating in a pendent orientation wherein both top and bottom face gratings serve to stabilize portions of said tool members extending through said top and bottom face openings; and

a tool hanger means pivotally carried on said body means and having a plurality of tool supporting hooks adapted to extend outwardly of said body means when said tool hanger is placed in a tool supporting position and said plurality of tool supporting hooks are adapted to fold generally flat against said body means when said tool hanger means is pivoted to a non-tool supporting position.

4,345,689
COMPOSITE SPIN WELDED COUPLER CARRIER ASSEMBLY

Osvaldo F. Chierici, Geneva, Ill., assignor to Holland Company, Aurora, Ill.

Filed Apr. 11, 1980, Ser. No. 139,439
Int. Cl.³ B61G 9/22, 7/10
U.S. Cl. 213—61 5 Claims



1. In a railroad car wheeled for riding on track rails and having a body including a center sill projecting from one end of the car and equipped with a coupler striker casting and a coupler mounted on the center sill for swinging movement sidewise of the car, said coupler including a shank extending through the casting, with the casting including a striker portion having a striking face disposed in a vertical plane and disposed transversely of the car center line of draft and a window opening disposed transversely of and aligned with the car center line of draft through which the coupler shank extends, said casting, adjacent said face, mounting below the coupler shank and across the lower side of the window, a coupler carrier on which the coupler shank rests, with the coupler carrier including a bearing member formed from an ultra high molecular weight polyethylene of dry self lubricating characteristics that is characterized by being resistant to adherence thereto of foreign matter, said polyethylene having a molecular weight in the range of from about 3,000,000 to about 9,000,000, said bearing member defining a flat horizontally disposed load support surface on which the coupler shank rides for supporting the coupler on the coupler carrier, and means for mounting said bearing member on a horizontal support member of said striker casting,

the improvement wherein:

the bearing member is of planar configuration and is coextensive in marginal configuration to said load support surface,

a metal mounting plate comprising a planar body on which said bearing member is disposed in overlying, parallel relation thereto and against one side of said plate body,

said mounting plate body defining upper and lower side surfaces that are substantially planar, and said upper side surface being at said one side of said plate body,

and means for securing said metal plate on said casting horizontal support member, with said lower surface of said plate body flush against said striker casting horizontal support member,

said plate body being formed to define a plurality of spaced apart apertures of circular outline each having a side wall surfacing that is of other than right configuration whereby said apertures each form marginal edgings on either side of said plate of which one of said marginal edgings is of less diameter than the aperture other marginal edging,

with said apertures being oriented such that said one of said marginal edgings thereof are at said one side of said plate,

said bearing member defining stud portions integral therewith that are respectively coextensive with said apertures, respectively, and that have their respective side walls conformed to, and in direct physical bearing relation with, the respective aperture side wall surfacings,

said stud portions each defining an end surface that is substantially coplanar with said plate body lower surface for flush fitting of said stud portion ends with the striker casting horizontal support member,

whereby said bearing member may be made fast to said mounting plate body free of bonding materials or mechanical fasteners.

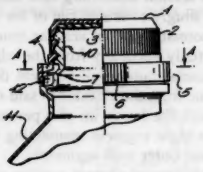
4,345,690
SAFETY CLOSURE

Eric T. Hopley, Norwich, England, assignor to U.G. Closures & Plastics Limited, Middlesex, England

Filed Sep. 15, 1978, Ser. No. 942,805
Claims priority, application United Kingdom, Sep. 19, 1977, 38896/77
Int. Cl.³ B65D 55/02, 85/56; A61J 1/00
U.S. Cl. 215—216 5 Claims

1. A container and a closure cap therefor, wherein the neck of the container is screw-threaded and is provided with at least one lug beneath the screw thread, the closure cap comprising a top, a screw-threaded depending skirt and an annular band attached to the skirt by four spaced bridges, the annular band being provided with one or more fins adapted to engage the lug(s) on the container neck, the annular band being deformable by radial pressure at positions spaced from the fin(s) to

increase the diameter of the band in the region of the fin(s) such that the fin(s) do not engage the lug(s) on the container neck,



the bridges attaching the annular band to the skirt being so situated that they are substantially undeformed when the annular band is deformed.

4,345,691

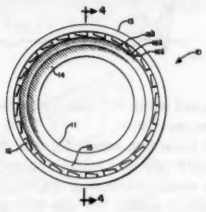
CHILD RESISTANT BOTTLE CLOSURE

James E. Burke, Huntington, Conn., assignor to Ethyl Products Company, Richmond, Va.

Continuation of Ser. No. 34,584, Apr. 30, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,398

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—216 **4 Claims**



1. A child-resistant closure assembly for connecting a pump or other dispensing device to a container comprising a cap and a fluid container, said cap having a circular outer ridge means, said cap and said container having a series of ratchet teeth thereon for mutual engagement to prevent said cap from being removed from said container when said cap is threaded onto said container, said ratchet teeth being spaced apart on said cap, said teeth on said cap having front and rear edges formed perpendicular to the tangent of said outer ridge and a beveled inner edge, said teeth on said container having generally rectangular, beveled outer surfaces and a rear edge perpendicular to the tangent of said outer ridge, the lower end of said teeth on said container merging into said container, said cap and said container having threads thereon for mutual engagement, said cap having a hole in the top thereof for receiving and connecting a pump or dispensing device to said container.

4,345,692

CLOSURE CAP FOR A CONTAINER

Albert Obrist, Kaiseraugst, and Hans Breuer, Balsthal, both of Switzerland, assignors to Albert Obrist AG, Reinach, Switzerland

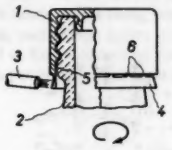
Filed Feb. 12, 1981, Ser. No. 233,884

Claims priority, application Switzerland, Feb. 14, 1980, 1203/80

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **6 Claims**

1. In a closure cap for a container comprising a cap portion, a guarantee strip, and a plurality of peripherally spaced rupturable web portions connecting the lower edge of said cap portion to said guarantee strip, said cap portion, guarantee strip and said web portions being integrally produced by an injection moulding process from a thermoplastics material, said guarantee strip being adapted to surround the neck of a container and to be form-locked thereabout by hot-deformation, the improvement in that the wall of the guarantee strip has an enlarged portion of relatively increased cross section and



amount of material in the region between each two successive rupturable connecting web portions, said enlarged portions being separated by wall portions of relatively lesser cross section in the region of each said connecting web.

4,345,693

AIR AND MOISTURE BARRIER FOR ELECTRICAL OUTLET BOXES

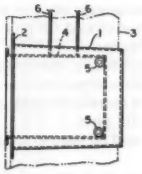
G. Russell Balkwill, 2429 Howard Ave., Windsor, Ontario, Canada (N8X 3Y5); Jules P. Robinet, 2865 Virginia Park, Windsor, Ontario, Canada (N9E 2B8), and John F. Tamasovics, 2530 Todd La., Windsor, Ontario, Canada

Continuation of Ser. No. 36,436, May 7, 1979, abandoned, which is a continuation of Ser. No. 908,223, May 22, 1978, Pat. No. 4,158,420. This application Aug. 4, 1980, Ser. No. 176,571

The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.

Int. Cl.³ H02G *3/08*

U.S. Cl. 220—3.3 **3 Claims**

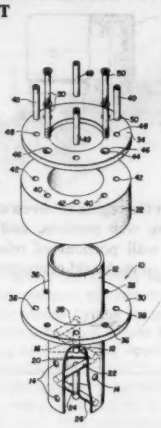


1. In combination, a rigid electrical outlet box having an open face, a cover of flexible plastic material of the same shape but slightly larger than the electrical outlet box extending around and enclosing all sides and the back of said outlet box opposite the open face so that the open face remains uncovered, to form an air and vapor barrier around the sides and back of said box, said cover having a flexible, thinwall flange around the perimeter near the open face of said box and extending outwardly therefrom and slanting away from said cover, whereby the peripheral edge of the flange can tightly contact the back surface of a wall or the like around the open face of the outlet box and on the same side of the wall or the like as the outlet box, and the cover provides a barrier to prevent water from entering the outlet box through the sides and back thereof.

4,345,694
ANTI-SIPHONING DEVICE

George S. Chambers, High Point, N.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Dec. 10, 1980, Ser. No. 215,132
Int. Cl.³ B65D 25/02, 39/12, 51/16; B67C 3/00
U.S. Cl. 220—86 AT 14 Claims



1. A device for preventing siphoning of a liquid from a container having a fill pipe comprising:

a fill tube having an outside diameter smaller than the inside diameter of said fill pipe;

a plurality of restriction means extending from the interior of said fill tube at different radial angles across the fill tube;

a first annular plate secured to the exterior of said fill tube having an outside diameter substantially equal to the inside diameter of said fill tube;

a second annular plate slidably received on the exterior of said fill tube having an outside diameter substantially equal to the inside diameter of said fill tube;

an elastomeric annulus positioned on the exterior of said fill tube between said first and second annular plates and having an outside diameter substantially equal to the inside diameter of said fill tube; and

means interconnecting said first and second annular plate for drawing said second annular plate toward said first plate to cause said elastomeric annulus to radially expand and engage the interior of said fill pipe thereby securing said device to said fill pipe.

12. A device for preventing siphoning of liquid from a container having a fill pipe comprising:

a fill tube having an outside diameter smaller than the inside diameter of said fill pipe;

means mounted to said fill tube to secure said fill tube to said fill pipe; and

a plurality of means, each secured at both ends thereof to said fill tube and axially and radially spaced, for restricting the interior of said fill tube without substantially obstructing liquid flow therethrough, each of said restriction means lie in a distinct plane orthogonal to the axis of said fill tube and crossing the center of said fill tube.

4,345,695
LID FOR A DRINKING CUP

James V. Galloway, deceased, late of Winnetka, Ill. (by Dean K. Galloway), and Scott F. Galloway, 2037 Pratt Ct., Evanston, Ill. 60093

Filed May 1, 1980, Ser. No. 145,700
Int. Cl.³ A47G 19/22; B65D 41/26, 51/16
U.S. Cl. 220—254 1 Claim

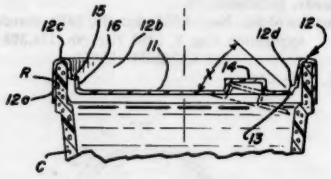
1. A lid for removable mounting on the rim of a drinking cup, the lid comprising:

(a) a substantially planar center section adapted to conform substantially to an area defined by the interior of the rim of the cup;

(b) a peripheral section delimiting said center section and adapted to fit snugly over said rim of the cup, the peripheral section consisting of an annular inner wall segment rising substantially vertically from the edge of the center section, an annular outer wall segment depending a substantial distance from the exterior of said rim of the cup to form a seal with the lower lip of a person drinking from the cup, and a bight segment connecting the upper edges of the inner and outer wall segments;

(c) a stiffening rib formed along a portion of the peripheral section adjacent the confluence of the bottom edge of said inner wall segment of said peripheral section with said substantially planar center section;

(d) an elongated U-shaped slit in said center section describing a resilient drinking portion in the center section, the bight portion connecting the two legs of said U-shaped slit being juxtaposed said stiffening rib and beveled at an angle



not to exceed about 45° relative to the exposed surface of said center section;

(e) elevated breathing means formed in said center section diametrically opposite said elongated U-shaped slit, said breathing means preventing the occurrence of a vacuum-like condition within the cup during drinking from the cup; and

(f) a protuberance formed in said center section substantially equidistant from the ends of said U-shaped slit and spaced away from the bottom of said U-shaped slit, the protuberance projecting upward a substantial distance from said center section but not exceeding the height of said inner wall segment of the peripheral section, the protuberance having a hollow interior adapted to communicate with the interior of the cup when the lid is mounted on the rim of the cup and sized relative to the drinking portion so that the latter is substantially open upon a predetermined depressing force being applied to the protuberance by the upper lip of a person drinking from the cup.

4,345,696
CONTAINER OPENING APPARATUS

Henry L. Guimarin, Irving, Tex., assignor to Guimarin Container Co., Incorporated, Dallas, Tex.

Filed Nov. 20, 1980, Ser. No. 208,589
Int. Cl.³ B65D 17/42
U.S. Cl. 220—277 11 Claims

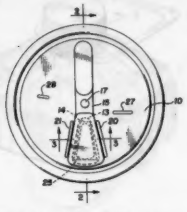
1. In a container end including a substantially flat disc-like body member having an outer major surface and an inner major surface and adapted to mate with a container body to form a sealed enclosure, the improvement comprising:

(a) a partially severable tab defined by a weakening score line in said substantially flat member, said tab including at least one inclined boss projecting outwardly from said outer major surface; and

(b) opening means comprising an elongated member disposed substantially diametrically across said end secured to said container adjacent said end and moveable in a plane substantially parallel with said outer major surface,

said opening means covering said tab and said inclined boss;

whereby movement of said opening means in said plane substantially parallel with said outer major surface causes



said opening means to engage said inclined boss and depress said tab inwardly into said container by at least partially severing said tab from said end along said weakening score line.

4,345,697

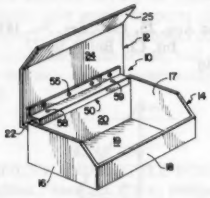
SEPARABLE HINGE ASSEMBLY FOR A COVER

Billy E. Wilson, and Coy R. Hutson, both of Parsons, Kans., assignors to Power-Flame, Inc., Parsons, Kans.

Filed Aug. 29, 1980, Ser. No. 182,654

Int. Cl.³ B65D *43/24*

U.S. Cl. 220—335 **25 Claims**



1. A hinge assembly for first and second panels, the combination comprising:

a first portion located on said first panel;

a lip extending from said first portion and having a distal edge;

a second portion located on said second panel;

a hinge member;

means for rigidly coupling said hinge member to said first panel,

said hinge member comprising

a leg, and

an intermediate portion extending from said first panel and having said leg extending therefrom substantially perpendicular to said lip,

said leg having a distal edge forming a slot with said distal edge of said lip, which slot receives said second portion therein,

said second portion being in contact with said lip when said first and second portions are substantially perpendicular,

said second portion being in contact with said leg when said first and second portions are substantially parallel.

4,345,698

AIRCRAFT SELF-SEALING FUEL TANK

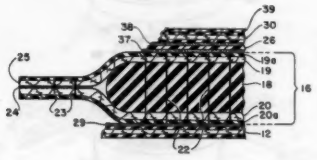
Herbert F. Villemain, Cuyahoga Falls, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1980, Ser. No. 133,767

Int. Cl.³ B65D *25/14*

U.S. Cl. 220—452 **1 Claim**

1. A self-sealing fuel tank, comprising: an innerliner member; a plurality of sealant panels secured to the exterior surface of the innerliner member and to each other to form the configuration of said fuel tank; each of said sealant panels including: a first layer of fabric having one rubberized side and one unrubberized side, a second layer of fabric having one rubberized side and one unrubberized side, a layer of sealant compound between said first layer and the second layer with the unrubberized side of the fabric layers being positioned adjacent the sealant compound; said fabric layers extending beyond the sealant compound to form connecting flanges, said first layer of fabric, second layer of fabric and layer of sealant compound



being joined by a plurality of rows of parallel stitching along their surface faces that are surrounded by said connecting flanges and a plurality of circumferential rows of stitching in the flanges adjacent the edge of the sealant compound; adhesive means, joining the flanges of each panel to the respective adjacent panels of the formed tank, for forming hinge-like flexible joints between the panels of said tank; a fuel barrier layer on the outer surface of the sealant panels and an outer member covering the external surface of the fuel barrier layer on all of said panels and joints.

4,345,699

LUBRICANT TANK

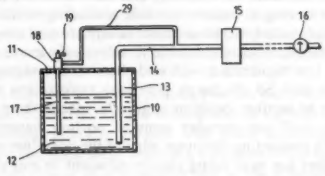
Clive N. Bunyan, Harrow, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 6, 1980, Ser. No. 204,700

Claims priority, application United Kingdom, Dec. 7, 1979, 7942305

Int. Cl.³ B67D *5/32*

U.S. Cl. 222—40 **6 Claims**

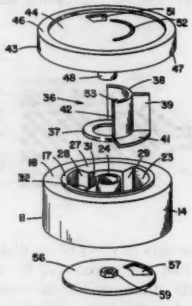


1. A tank suitable for holding a lubricant and comprising a removable dipstick, means for the reception and support of said dipstick, first duct means for the withdrawal of lubricant from said tank, second duct means interconnecting said first duct means with said dipstick support means, and pump means associated with said first duct means, said pump means being adapted to pump lubricant from said tank through said first duct means, said dipstick and dipstick support means being adapted and arranged such that said second duct means is obturated only when said dipstick is correctly positioned in said dipstick support means, said second duct means being so adapted and arranged that when not so obturated by said dipstick, air is drawn therefrom into said first duct means by the action of said pump means to reduct the pressure of said lubricant within said first duct means, means being provided to detect and indicate said pressure reduction.

4,345,700
VARIABLE QUANTITY DISPENSING DEVICE FOR GRANULAR MATERIAL

David W. Souza, Fremont, Calif., assignor to SJ Marketing Incorporated, Palo Alto, Calif.

Filed Apr. 28, 1980, Ser. No. 144,226
Int. Cl.[3] G01F *11/46*
U.S. Cl. 222—438 13 Claims



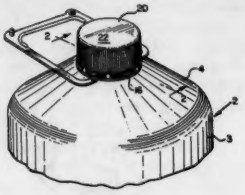
1. A device for dispensing material from a container having an externally threaded neck forming an opening, comprising: a cap member having an annular internally threaded outer wall to be threadably secured to said neck, a cup-like coffer extending into said outer wall and opening outwardly therefrom, said coffer including an annular inner sidewall concentrically within and spaced from said outer wall, and an annular portion completely joining adjacent ends of said inner and outer walls; a protruding member extending into said coffer from the sidewall thereof; a lid member rotatably secured to said cap member, and having a circular disc top wall disposed to close the open end of said coffer and a depending integral annular wall surrounding said annular portion of said cap member; a discharge port in said lid member top wall; a disc bottom cover connected to said lid member for rotation therewith beneath and to close the bottom of said coffer; an inlet port in said bottom cover angularly spaced from said lid discharge port; an adjustable member rotatably secured within said coffer and including a radially extending wall angularly spaced from said protruding member; said protruding member, radially extending wall, sidewall, lid member, and bottom cover defining a chamber having a volume variable according to the angular position of said adjustable member relative to said cap member; said lid member being rotatable to selectively move said inlet opening into registration with said chamber in one position and to move said lid discharge port into registration with said chamber in another position angularly spaced from said one position; said cap member annular portion having sealing means for contacting the outer edge of the container neck; said lid member top wall being closely adjacent to and parallel to said cap member annular portion; and manually operable means extending through said lid member top wall for rotating said adjustment member relative to said lid member and said cap member.

4,345,701
CONTAINER CLOSURE DEVICE

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 81,593, Oct. 3, 1979, Pat. No. 4,299,330.
This application Jan. 21, 1981, Ser. No. 226,987
Int. Cl.[3] B65D *5/72, 25/40, 35/38*
U.S. Cl. 222—569 10 Claims

2. A connection for a plastic neck member with a neck portion having a cylindrical wall and an inwardly turned curl with a smooth annular inner, upper and lower surface and an annular outer face with radially outwardly extending projection means, said plastic member being heat-softenable and having a slot at one end extending inwardly therefrom flanked by inner and outer flange portions and terminating in an inner

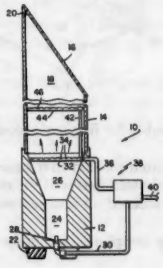


groove complemental to said surface and in engagement therewith, said outer flange being deformed into pockets opposing respective projection means attendant to heating of said neck member to a predetermined temperature.

4,345,702
FIBER DISSEMINATOR

Neil M. Wolfe, Cecil City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1980, Ser. No. 181,141
Int. Cl.[3] B65D *88/72*
U.S. Cl. 222—630 9 Claims



1. A fiber disseminator which comprises:

a vertically-disposed vessel having lower, intermediate and upper chambers, said upper chamber being of larger cross-section than said lower chamber;

a top wall formed of a transparent material dispersed over said upper chamber of said vessel;

first conduit means for intermittently introducing a suspension media into a lower portion of said lower chamber, and for upwardly dispersing said fibers from a stored position in said lower chamber to a dispersed position in said intermediate and upper chambers;

second conduit means for continuously introducing said suspension media into said intermediate and upper chambers for separating and transporting said fibers through said upper chamber; and

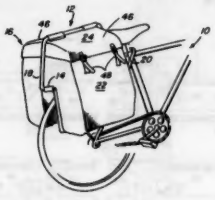
orifice means for ejection of separated fibers and venting of said suspension media from said upper chamber of said fiber disseminator, said orifice means including an opening positioned in a top end of said upper chamber;

said disseminator permitting dispersion of a known deposition of fiber of a controlled and selected size.

4,345,703
CARRYING BAG, PARTICULARLY FOR BICYCLES

Richard A. Allen, Bowles Ter., Lincoln, Mass. 01773

Filed Feb. 17, 1981, Ser. No. 234,773
Int. Cl.³ B62J 9/00
U.S. Cl. 224—32 A 11 Claims



1. A carrier configured to be mounted on a bicycle, said carrier comprising:

(a) a foldable frame having an upper member and a pair of side members;

(b) a bag fitted to said frame, said bag having an upper compartment and a pair of side compartments; and

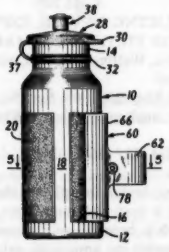
(c) means for holding said frame and said bag to the bicycle, said frame operative to hold said upper compartment over a wheel of the bicycle and each of said side compartments at each side of the wheel when said carrying bag is mounted to said bicycle;

(d) said frame including a pair of pivotable members, each said pivotable member having an upper support and a lower outrigger, said upper supports operative to hold said bag upright to maintain said upper compartment in an expanded position above the wheel, said outriggers operative to keep said side compartments away from the spokes of the wheel.

4,345,704
BOTTLE MOUNT AND BOTTLE FOR BICYCLES

Matthew S. Boughton, Stamford, Conn., assignor to Cannondale Corporation, Stamford, Conn.

Filed Sep. 2, 1981, Ser. No. 298,641
Int. Cl.³ B62J 11/00
U.S. Cl. 224—39 9 Claims

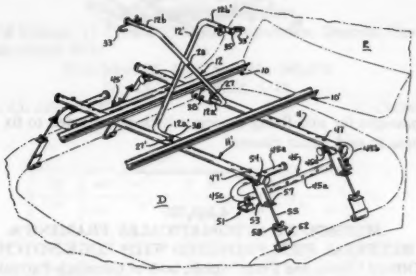


1. A bottle mount and bottle combination for bicycles wherein the mount comprises means defining a concave surface that is a segment of a surface of revolution generated by a substantially straight line and is of not more than about 180 degrees in circumferential extent, one element of a hook and loop cloth fastener affixed to the concave surface, and means for fastening the mount to a bicycle with the concave surface facing generally upwardly, and wherein the bottle comprises a receptacle, a portion of the receptacle having an outer surface that is complementary throughout its circumferential extent to the concave surface of the mount and the other element of the hook and loop cloth fastener being affixed to said complementary portion of the receptacle, and a removable closure for the receptacle.

4,345,705
AUTOMOBILE ATTACHED CARRIER

Joseph V. Graber, 3739 County Trunk M, Middleton, Wis. 53562

Filed Mar. 6, 1981, Ser. No. 241,099
Int. Cl.³ B60P 3/06
U.S. Cl. 224—42.03 B 14 Claims



1. An automobile attached carrier for supporting at least two bicycles comprising,

(a) first and second channels each adapted to receive the front and rear wheels of a bicycle,

(b) first and second cross frame members extending crosswise of the channels and secured thereto to support the channels in laterally spaced relation,

(c) means for mounting the first and second cross frame members on the roof or deck lid of an automobile,

(d) first and second elongated bicycle support members,

(e) first and second bracket means mounting one end portion of the first and second elongated bicycle support members respectively on the first and second cross frame members for swinging movement in generally upright planes intermediate the channels from a lower folded position adjacent the level of the channels to a raised support position in which the elongated bicycle support members extend upwardly at an acute angle to the horizontal and cross each other at a location intermediate their ends,

(f) means detachably interconnecting the first and bicycle support members intermediate their ends at the crossing location,

(g) and first and second arm means on the other end portion of the respective first and second bicycle support members extending laterally thereof and each including clamp means for detachably engaging a portion of the frame of a bicycle resting in a respective one of the channels.

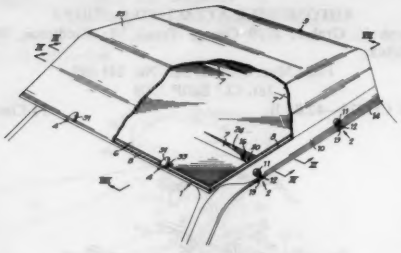
4,345,706
LUGGAGE-CARRIER OR AUXILIARY LUGGAGE COMPARTMENT FOR MOTOR CARS

Claude Benit, Transvaalstraat 17, 2600 Berchem, Belgium

Filed Mar. 24, 1980, Ser. No. 132,860
Claims priority, application Belgium, Mar. 28, 1979, 2/57691
Int. Cl.³ B60R 9/04
U.S. Cl. 224—327 7 Claims

1. Luggage carrier for a roof of a motor car having a gutter channel, said carrier including a substantially planar base and a plurality of releasable fixing devices, said base having a plurality of transverse channels with open tops and with bottom parts fitting the shape of said roof, said fixing devices being in said channels, said base further having longitudinal rims each of which is provided with a strip-shaped support, the lower

edge of which is shaped to fit in said gutter channel, said support having, in alignment with the said transverse channels,



passages for said fixing devices which are adapted to fix said base to said gutter channel.

4,345,707

METHOD OF AUTOMATICALLY FRAMING A REVERSAL FILM PROVIDED WITH EDGE NOTCHES

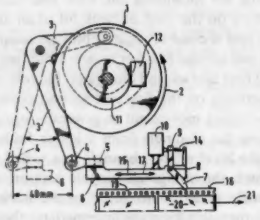
Otfried Urban, and Peter Mundt, both of Garmisch-Partenkirchen, Fed. Rep. of Germany, assignors to Geimuplast Peter Mundt GmbH & Co., KG, Farchant, Fed. Rep. of Germany

Filed Dec. 5, 1979, Ser. No. 100,550

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853158

Int. Cl.³ B65H *17/40*

U.S. Cl. 226—68 **6 Claims**



1. An apparatus for automatically framing an edge notched reversal film, the edge notches bearing predetermined relationships to image bearing portions of the film to be framed, said apparatus comprising:

means for feeding film including a feed gripper (7) engageable with an edge notch for feeding film, and drive means for moving said feed gripper through an operating cycle, the feed gripper during a first portion of the operating cycle engaging an edge notch and feeding the film, and the feed gripper during a second portion of the operating cycle disengaging from an edge notch and moving into a position for engaging a succeeding edge notch located within a predetermined range of variable spacings from the previously engaged edge notch; and

first (12) and second (10) switch means for controlling said drive means, said first switch means (12) being actuatable by said drive means during the second portion of the operating cycle and being open during at least a part of said first portion of the operating cycle, said second switch means (10) being independent from said first switch means and being actuatable by engagement of said feed gripper with an edge notch, said drive means moving said feed gripper when at least one of said switch means is actuated.

4,345,708

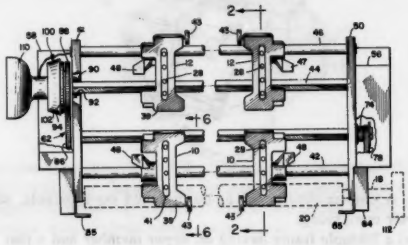
DOCUMENT FEED MECHANISM

Leo J. Hubbard, Somerset, Mass., assignor to P.H.D. of Puerto Rico, Inc., Fajardo, P.R.

Filed May 27, 1980, Ser. No. 153,394

Int. Cl.³ B65H *17/38*

U.S. Cl. 226—74 **10 Claims**



1. A web feed mechanism which comprises first and second feeding means which are disposed in driving relationship with the web when it is driven and which are spaced from each other to define a length of said web therebetween, driving means coupling said first and second feeding means in driving relationship with each other, said driving means comprising driven means connected in driving relationship with said second feeding means, means coupling said first feeding means to said driven means for driving said first feeding means when said second feeding means is driven, and a clutch in said means coupling said first feeding means to said driven means for decoupling said first feeding means from driving relationship with said driven means so that said second feeding means can move said web with respect to said first feeding means until the tension in said length of said web is adjusted, said clutch having a pair of plates one of which is rotatable with said driven means and the other of which is rotatable with said first feeding means, and manually operable means connected to said other of said plates for separating said plates and holding said first feeding means stationary to prevent movement thereof with respect to said web until said tension in said length of said web is adjusted.

4,345,709

PAPER SPLICING DEVICE, ESPECIALLY FOR CIGARETTE OR FILTER ROD-MAKING MACHINES

Ronald S. C. Barton, Welling, England, assignor to Molins, Ltd., London, England

Filed May 23, 1980, Ser. No. 152,845

Claims priority, application United Kingdom, May 29, 1979, 7918676

Int. Cl.³ B65H *23/08, 17/32*

U.S. Cl. 226—195 **14 Claims**

8. A web splicing device for splicing the leading end of a first web provided by a first web supply to the trailing end of a second web which is being drawn through said web splicing device by a web receiving apparatus, said web splicing device comprising:

a reservoir through which said second web is drawn by said web receiving apparatus;

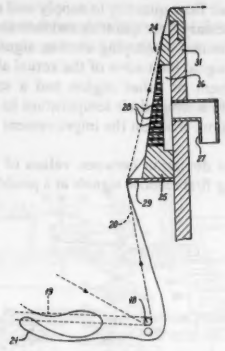
a suction brake acting on said second web after it leaves said reservoir so as to tension said second web by a predetermined amount;

drive means for supplying said second web to said reservoir at a rate greater than the rate at which said second web is withdrawn therefrom in preparation for splicing, thereby to accumulate said second web in said reservoir;

splicing means upstream of said reservoir for splicing the leading end of said first web to the trailing end of said second web; and

an auxiliary suction brake, positioned upstream of said first-

mentioned suction brake and responsive to said drive means accumulating said second web in said reservoir, for



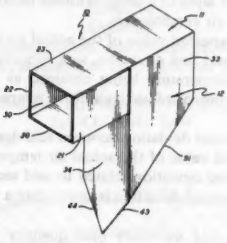
engaging said second web to maintain said predetermined amount of tension on said second web as it leaves said reservoir.

4,345,710

TEMPORARY MATERIAL RECEPTACLE

Donald R. Gillespie, R.D. #2, Stump Rd., Skaneateles, N.Y. 13152, and John M. French, Jr., 314 Garden City Dr., Mattydale, N.Y. 13211

Filed Mar. 20, 1981, Ser. No. 245,941
Int. Cl.³ B65D *5/52, 91/00*
U.S. Cl. 229—16 R **8 Claims**



1. A self-locking receptacle for printed material and the like that is formed by folding a single board of foldable material that includes

a rectangular bottom panel,

a pair of complimentary rectangular side panels, each side panel being of substantially the same length as the bottom panel and having its lower side edge foldably attached to one of the side edges of the bottom panel,

a rectangular top panel being of substantially the same length as the side bottom panels having a first one of its two side edges foldably attached to the upper side edge of one of the side panels whereby the four cojoined panels can be folded into a rectangular housing,

an elongated support panel foldably attached to the second side edge of the top panel and having at least one longitudinal side edge that is normal to said second side edge of the top panel, the width of said support panel being less than the length of the top panel,

a rectangular shaped bladed front panel foldably attached to said one side edge of the support panel, the top edge of the front panel being parallel with the second side edge of the top panel and being spaced therefrom a distance that is substantially equal to the width of the side panels, the width of the front panel being substantially equal to the width of the bottom panel, and the bottom portion thereof terminating in a point,

a locking panel foldably attached to a second side edge of the bladed panel, the top edge of the locking panel being coplanar with the top edge of the blade panel,

a locking tab foldably attached to the top edge of the locking panel, and

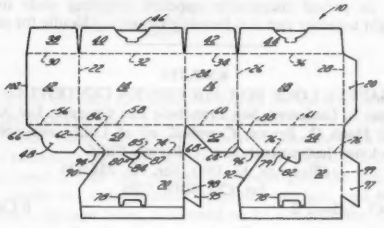
said bottom panel having a slotted hole formed therein for receiving the locking tab therein.

4,345,711

PARTITIONED CARTON

David Fischer, 12 Cavotti Crescent, Downsview, Ontario, Canada (M3H 4V1)

Filed Mar. 23, 1981, Ser. No. 246,676
Int. Cl.³ B65D *5/46, 5/48*
U.S. Cl. 229—41 R **11 Claims**



1. A carton blank comprising a first end wall and a first side wall, a second end wall and a second side wall foldably interconnected by a plurality of substantially parallel fold lines and adapted to form a knock-down sleeve, bottom flaps connected one to each of said end and side walls by fold lines substantially perpendicular to said set of fold lines, means permitting interconnection adjacent pairs of said bottom flaps to form a self erecting bottom when said knocked down sleeve is squared, a partition panel foldably connected to each of said bottom flaps connected to said first and second side walls via fold lines substantially perpendicular to said set of fold lines, said partition panels each terminating in a free end, said bottom flaps and said partitions being cut away to permit erection of said bottom as said sleeve is squared, means defining an aperture in one of said partition panels adjacent its fold lines connection to said side bottom flap to which it is foldably connected, a projection extending from said side bottom flap from which the other of said partition panel is foldably connected, an abutment edge on said projection, said projection being formed from said other partition panel, said projection and aperture being relatively positioned and shaped to cooperate so that said projection enters said aperture as a knock down sleeve formed from said blank is squared from a knocked-down position to an erected position and said abutment edge engages a wall of said aperature to prevent said sleeve from returning to knocked down condition.

4,345,712

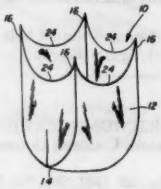
PLASTIC BAG

Heung S. Gim, 5389 W. 229th St., Fairview Park, Ohio 44126

Filed Sep. 24, 1980, Ser. No. 190,230
Int. Cl.³ B65D *33/24*
U.S. Cl. 229—62 **3 Claims**

1. A bag formed from a tubular strip of material comprising a body portion having a four-sided configuration with an opening at one end thereof, said body portion being formed by adjacent layers of the tubular strip of material, the respective longitudinal edges of said adjacent layers being in register the material between said adjacent layers being tucked inwardly to

form two inward folds with one of said adjacent layers on opposite sides thereof, and a bottom portion integrally formed to said body portion at the other end thereof, said opening being defined by a generally arc-like cut in each surface defining the four sides of said body portion, said arc-like cut being



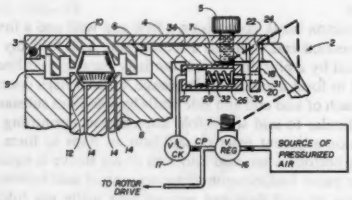
continuous on each surface defining said four sides of said bag forming fastening ends at the junction of those of said surfaces that are adjacent, the length of said fastening ends being sufficient to permit diagonally opposite fastening ends to be brought together and tied forming a carrying handle for same.

4,345,713

SAFETY LOCK FOR AIR DRIVEN CENTRIFUGE

William S. Gutierrez, San Francisco; Lee Gropper, Los Altos, and Hugh O. Brown, Campbell, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 13, 1981, Ser. No. 254,020
Int. Cl.³ B04B *7/06*
U.S. Cl. 233—1 B **6 Claims**



1. In an air driven centrifuge having an access door to a rotor chamber housing a rotor seat and a rotor having a plurality of turbine flutes formed in the underside thereof, said rotor seat having driving air jet means connected to a source of pressurized air for impinging pressurized air streams against said turbine flutes for supporting and spinning said rotor on an air cushion above said rotor seat within said chamber, the improvement comprising:

means for preventing the opening of said access door when pressurized air is supplied to said air jet means; and

means for delaying, for a predetermined time, the opening of said access door after said supply of pressurized air to said air jet means is discontinued.

4,345,714

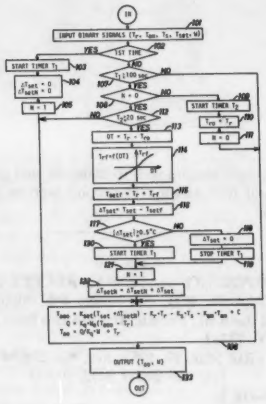
CONTROL METHOD AND APPARATUS FOR AIR CONDITIONERS

Yasuhumi Kojima, Gifu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 28, 1980, Ser. No. 173,894
Claims priority, application Japan, Aug. 1, 1979, 54-98528
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—46 R **8 Claims**

1. A method of controlling an air conditioner which supplies an air flow into a compartment or other region, the air conditioner comprising air flow quantity control means and air flow temperature control means, the method comprising the steps of detecting the quantity of heat necessary for adjusting the actual temperature of air in said compartment or other region to a desired value and to maintain it at said desired value, and controlling said air flow temperature control means in such manner that the air flow temperature is such as to enable the air flow at a desired air flow quantity to supply said necessary heat quantity, said necessary heat quantity and said air flow temperature being determined employing electric signals in the form of a first electric signal indicative of the actual air temperature in said compartment or other region and a second electric signal indicative of a desired air temperature in said compartment or other region, wherein the improvement comprises the steps of:

detecting a first deviation between values of the preceding and following first electric signals at a predetermined time



interval after lapse of a predetermined period of time from starting the air conditioner;

detecting an expected value of the actual air temperature in relation to said first deviation, said expected value of the actual air temperature being obtained as a stable value under the control of said air flow temperature control means;

detecting a second deviation between said desired value and said expected value of the actual air temperature;

detecting a third deviation related to said second deviation when said second deviation is larger than a predetermined value; and

compensating said necessary heat quantity in accordance with said third deviation.

4,345,715

SAFETY DEVICE FOR A HEAT EXCHANGE EQUIPMENT FILLED WITH PRESSURIZED LIQUID

Raymond J. E. Van Craenenbroeck, Bergmolenstraat 64, B 2740 Melsele, Belgium

Filed Aug. 13, 1980, Ser. No. 177,578
Claims priority, application Belgium, Aug. 24, 1979, 2/58027
Int. Cl.³ F24D *3/10*
U.S. Cl. 237—66 **12 Claims**

1. A safety device for heat exchange equipment fillable with pressurized liquid, which safety device comprises:

a. a vessel with sidewalls having an overflow for discharging liquid from said vessel when the liquid rises above the level of said overflow,

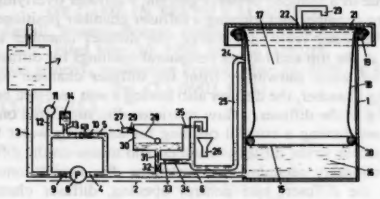
b. a diaphragm mounted in said vessel movable by the liquid inside said vessel between a position below the overflow and a position above said overflow to separate said vessel into a lower and an upper space, said upper space being open to the atmosphere,

c. a pipe for connecting the lower space of the vessel to the equipment to be protected, which pipe is divided in one

location into two paths which paths subsequently join before reaching the equipment,

d. a pump with its pressure side directed toward the equipment in one path,

e. a one-way valve through which liquid flows to the equipment, in the same path and thus in series with said pump,



f. an electro-magnetic valve in the other path,

g. a contact manometer connected to said other path between the equipment and the electro-magnetic valve, and

h. means for controlling said pump and said electro-magnetic valve based on the pressure measured by the manometer.

4,345,716

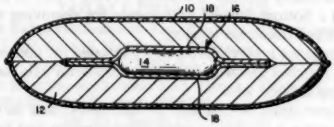
SACHET

John C. Armstrong, Milton, and Joseph H. O'Neil, Brewster, both of Mass., assignors to The Pharmasol Corporation, Randolph, Mass.

Filed Jul. 21, 1980, Ser. No. 170,954

Int. Cl.³ A61L *9/04*

U.S. Cl. 239—56 **12 Claims**



1. A sachet comprising a pillow-shaped case defining an enclosure, said case being comprised of two substantially coextensive sheets of porous, flexible, fabricated material joined at their edges, an absorbent stuffing constrained within the casing comprised of two substantially coextensive layers of relatively loosely associated fibers, said layers of absorbent stuffing being coextensive and in intimate surface contact with the sheets comprising the case and holding the latter distended, a covering defining a cavity within the case located between the stuffing layers, the said covering comprising coextensive plies of fibrous materials and a frangible capsule containing a volatile material positioned in the cavity between the plies of the covering, said covering and capsule positioned therein being centered with respect to the sides and edges of the case, and wherein the plies of the covering extend laterally beyond the capsule in the plane defined by the meeting surfaces of the stuffing layers a distance less than coextensive with the stuffing plies.

4,345,717

LOW PRESSURE FUEL INJECTION SYSTEM

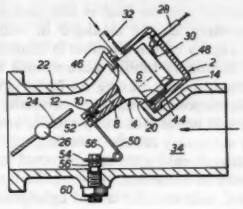
Michael W. Clark, Witham, and Barrie J. Martin, Shenfield, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Continuation of Ser. No. 1,859, Jan. 8, 1979, abandoned. This application Apr. 4, 1980, Ser. No. 137,419

Claims priority, application United Kingdom, Jan. 17, 1978, 1905/78

Int. Cl.³ B05B *1/08, 3/14, 17/06*

U.S. Cl. 239—102 **5 Claims**



1. A low-pressure fuel-injection system for the injection fuel at a pressure less than 39 p.s.i. into the intake air of a combustion engine, which system comprises an injector having a body; a fuel passage in the body; an outlet orifice arranged at a downstream end of said fuel passage for discharging the fuel into such intake air; a single valve obturator element, said single obturator element being positioned at the downstream end of said outlet orifice for closing said orifice; a spring positioned downstream of said outlet orifice for urging the single valve obturator element to close the outlet orifice on its downstream side, said spring being sufficiently strong to hold said obturator in an orifice-closing position against the force exerted upon it by such low-pressure fuel in said orifice; and vibrator means for vibrating the injector to overcome the spring force and thereby move the single valve obturator element away from the outlet orifice to enable fuel to be discharged through the outlet orifice.

4,345,718

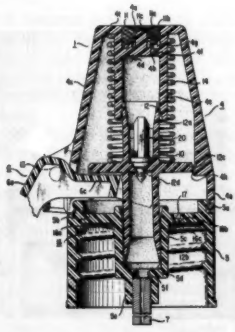
MANUALLY ACTUATED TRIGGER SPRAYER

William Horvath, 10 Crestwood Dr., Watchung, N.J. 07060

Continuation-in-part of Ser. No. 32,334, Apr. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 875,685, Feb. 6, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 106,398

Int. Cl.³ B05B *9/043*

U.S. Cl. 239—333 **27 Claims**



1. A manually operated spray dispenser constructed in com-

bination with the closure of a container of fluid product having an upwardly extending mouth, said dispenser comprising in combination:

an accumulator housing forming in fixed relation to said closure an outer tubular wall constructed to extend upwardly from the mouth of said container, said accumulator housing enclosing in integral coaxial relation an upper stationary tubular accumulator, and the mouth of said container enclosing in integral coaxial relation a lower stationary tubular member vertically spaced apart from said upper tubular accumulator;

means for communicating between said lower stationary tubular member and the fluid in said container;

a spray dispensing nozzle mounted in said accumulator housing in a spray button chamber in communication with said upper stationary tubular accumulator member;

a hollow tubular piston having its upper and lower ends respectively disposed to move in vertically reciprocating relation in said upper stationary tubular accumulator and said lower stationary tubular member;

an annular lateral enlargement connected to said hollow tubular piston intermediate between the upper and lower ends thereof, said annular lateral enlargement having an upper face and an underside;

means comprising a check valve located in said hollow tubular piston intermediate between the upper and lower ends of said piston and responsive to a pressure differential between said ends to admit said fluid product from the lower end into the upper end of said hollow tubular piston;

a helical coil-spring surrounding said upper stationary tubular accumulator and compressed between a fixed upper wall of said accumulator housing and the upper face of said annular lateral enlargement;

a pivot mounted in horizontal relation to the outer tubular wall of said accumulator housing;

trigger means mounted to rotate in a vertical plane about said pivot, said trigger means including a downwardly extended trigger arm, and horizontally extended lever means disposed to contact the underside of said annular enlargement and to move said hollow tubular piston vertically against the compression of said coil spring; and

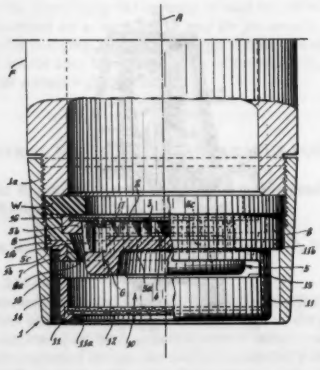
means for maintaining said container at substantially ambient pressure.

4,345,719

WATER AERATOR

Robert E. Bock, Woodbury, Conn., assignor to WPM, Inc., Waterbury, Conn.

Filed Mar. 31, 1980, Ser. No. 135,352
Int. Cl.³ E03C *1/084*
U.S. Cl. 239—428.5 **17 Claims**



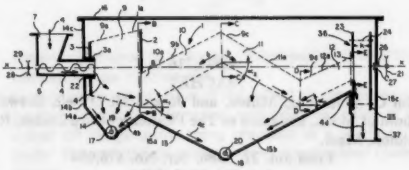
1. In a water aerator for delivering an aerated bubbly stream, the combination of a cylindrical barrel adapted to be removably secured at its upper portion to a source of water under pressure, a basket mounted in the barrel and surrounding a mixing chamber, screen means supported by the basket below said chamber and through which said stream is adapted to be discharged, said barrel and basket having opposing parts forming a passage for flow of atmospheric air into the mixing chamber due to a reduced pressure therein, a diffuser overlying the mixing chamber and forming a diffuser chamber positioned to receive water from said source, the diffuser chamber being open at the top and having peripheral openings for diffusing a flow of water outwardly from the diffuser chamber to the mixing chamber, the diffuser also having a seat recessed below the top of the diffuser, a flow restrictor disc supported on said seat and having a control opening for admitting water from said source to the diffuser chamber, and means on the diffuser for releasably retaining said restrictor disc against removal from the diffuser, said control opening, diffuser chamber, peripheral openings and mixing chamber forming a path through which water is adapted to flow from said source to said screen means for discharge from the aerator.

4,345,720

APPARATUS FOR THE TREATMENT OF SOLID, GRANULAR AND/OR LUMPY MATERIALS

Istvan Takacs; Endre Vereczkey; Gyula Bosits, and György Kerey, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Nov. 28, 1979, Ser. No. 97,971
Claims priority, application Hungary, Mar. 21, 1979, RI 700
Int. Cl.³ B02C *23/10*
U.S. Cl. 241—74 **7 Claims**



1. An apparatus for screening solid materials comprising:

a horizontally elongated housing having a pair of end walls and a bottom formed with means for removing screened material from said housing;

an elongated rotary sieve body journaled on said end walls for rotation about a generally horizontal axis, said body being formed with

a sieve drum at one end of said body, said sieve drum having a frustopyramidal configuration and being disposed symmetrically with respect to said axis while being rotatable therearound and having a pair of axially spaced plates, and drum diverging toward the other end of said body and having a periphery formed by planar and perforated sieve surfaces, said drum having central opening in one of said plates disposed proximal to one of said end walls and an opening in an other of said plates which is eccentric to said axis,

a generally zigzag-shaped tube communicating with said opening in said other of said plates and formed with at least three angularly adjoining tube sections, each having a polygonal cross section formed by planar sieve walls, and

a discharge drum communicating with said tube remote from said frustopyramidal drum and having an open periphery;

means for introducing material to be screened into said frustopyramidal drum through said central opening in said one of said plates whereby some of said material passes through said body with a combined spiraling and back and

forth movement and is discharged from the periphery of said discharge drum; and

means at an end of said housing in the region of said discharge drum for collecting material discharged therefrom.

4,345,721

APPARATUS FOR THE VARIABLE SPEED CONTROL OF CAMS IN TEXTILE MACHINES

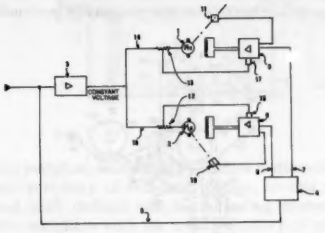
Yves Derail, Roanne, France, assignor to ASA S.A., France

Filed Mar. 10, 1980, Ser. No. 128,918

Claims priority, application France, Mar. 16, 1979, 79 07221

Int. Cl.³ B65H *54/38*

U.S. Cl. 242—18.1 **10 Claims**



1. In an apparatus for the control of speed variation of textile machine cams where a textile machine has two symmetric sides and each side has cams which provide for a back and forth movement to guide the winding of the threads upon spools, the cams of each side being controlled by a motor which is mechanically linked to the cams, the improvement comprising:

a common induction source connected to the motors on each side of the textile machine, said common induction source being adapted to establish the two motors' average speed and to exchange the two motors' braking energy, the variations around the average speed of the two motors being modulated in phase opposition by a flux variation in each motor thereby producing a staggering of the thread wound upon the spools from one layer to the other end and thereby avoiding bunching on the formed winding.

4,345,722

DOUBLE-DRUM WINDER

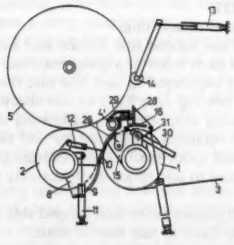
Friedrich Kuhn, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,423

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930474; Mar. 7, 1980, 3008785

Int. Cl.³ B65H *17/12, 19/26*

U.S. Cl. 242—56 R **18 Claims**



1. A double-drum winder for winding a web in a roll on a winding core, comprising:

first and second support drums having parallel axes, each of said support drums being rotatable about its respective axis; said support drums being disposed side-by-side and defining a first gap between them; said support drums adapted to support a roll that comprises a winding core and a web wrapped around the winding core, said support drums being adapted to support the roll in such a manner that when the roll is placed on said support drums with a portion of the web extending through said first gap and said drums rotate, the portion of said web extending through said first gap is wound onto the roll;

means for rotating at least one of said support drums in a direction such that the web moves through said first gap and then through a second gap defined between the first of said drums and the roll and is then wound onto the roll;

means for raising the roll off said first support drum after the roll has been placed on said first support drum and after the web has been wound on the roll, said raising means displacing the roll generally away from said first support drum and generally toward the second of said drums, whereby raising the roll enlarges said second gap;

a holding ledge movable into said first gap for engaging the web on the side thereof facing toward said second drum for pressing the web against said first drum;

severing means movable into said second gap for engaging the web on the side thereof facing toward said first drum and for engaging said holding ledge and for severing the web between said severing means and said holding ledge.

4,345,723

RETRACTOR PROVIDED WITH A TAKE-UP FORCE REDUCING MECHANISM

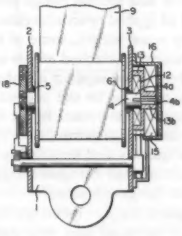
Masaru Morinaga, Yamato, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,034

Claims priority, application Japan, Oct. 9, 1979, 54-138359[U]

Int. Cl.³ A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107 **4 Claims**



1. A seat belt retractor provided with a take-up force reducing mechanism which has two spiral springs, at least one of which acts for webbing take-up and in which the webbing take-up force can be reduced by controlling at least one of the two springs, the retractor including:

a take-up shaft;

a cam rotatably fixed to the take-up shaft and having a cam track with a small-diameter circular cam portion, a large-diameter circular cam portion, and a spiral cam portion interconnecting the circular cam portions;

a cam follower adapted to follow the cam portions of the cam track;

cam follower guide means at the junctions of the respective cam track portions for (a) guiding the cam follower during webbing pay-out from one of the small-diameter and large-diameter cam portions to the spiral cam portion, then into the other of the small-diameter and large-diameter cam portions, (b) then retaining the cam follower in said other circular cam portion during continued webbing pay-out, (c) guiding the cam follower during webbing

rewind from said other circular cam portion into the spiral cam portion, then from the spiral cam portion into said one circular cam portion, and (d) then retaining the cam follower in said one cam portion during continued webbing rewind; and

spring force controlling means for reducing the take-up force when the cam follower is retained in said other circular cam portion.

4,345,724

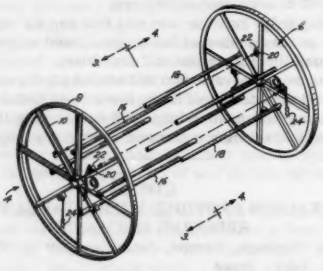
LIGHTWEIGHT REEL

Willard G. Lindell, Maple Park, Ill., assignor to The Anaconda Company, Denver, Colo.

Filed Jun. 23, 1980, Ser. No. 162,002

Int. Cl.³ B65H *75/22*

U.S. Cl. 242—115 **3 Claims**



1. A lightweight, readily assembled and disassembled reel for transporting and dispensing material such as electrical conductor, said reel having an assembled condition and a disassembled condition, said reel, in the assembled condition comprising:

(i) a pair of first and second flange portions;

(ii) a plurality of spaced apart elongated support members of substantially equal length, some of said support members being permanently attached at one end to said first flange portion, other of said support members being permanently attached at one end to the second flange portion, said elongated support members being in an upright position relative to said flange portions;

(iii) means for quickly and detachably connecting the other ends of each of said elongated support members to the other of said flange portions;

(iv) said elongated support members when connected to said other flange portions and said pair of flange portions defining support means for the material being stored; and said reel, in said disassembled condition, comprising:

(i) said elongated support members being completely disconnected and free at the other ends from the flange portions;

(ii) said flange portions being positionable adjacent each other in a stacked configuration, with said elongated support members positioned to extend from the flange portions in the same direction through adjacent stacked flange portions and the other ends of said elongated members being in a laterally spaced relationship to each other.

4,345,725

BRAKING MECHANISM OF A TAPE RECORDER

Toshikazu Kato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 29, 1980, Ser. No. 154,443

Claims priority, application Japan, Jun. 18, 1979, 54-83250[U]

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—204 **5 Claims**

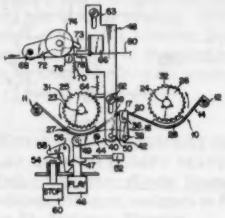
1. In a tape recorder, an improved braking mechanism for applying respective braking forces to a pair of reel shafts of the tape recorder, comprising:

an elongated brake band made of flexible material and having two opposite end portions;

means for rotatably mounting said end portions spaced from each other;

a connecting means coupled to a middle portion of said brake band and being rotatably connected to a movable member which operates interlockingly with an operation mode button of the tape recorder; and

a pair of brake discs mounted respectively on the reel shafts of the tape recorder, each brake disc having on the periphery thereof a brake member, said brake members each including a plurality of protruding portions which are inclined at a predetermined angle to the radial direction of the respective brake disc, the plurality of protruding portions of each respective brake member being inclined in the same direction relative to said radial direction, and the protruding portions of one of said brake members being inclined unidirectionally in the opposite direction to the unidirectional inclination of the protruding portions of the other of said brake members;



said brake band having respective portions which are adapted to be pushed against respective brake members to engage said respective brake members when the operation mode button is operated such that said brake members cut into a corresponding portion of the brake band when a corresponding brake disc rotates in one direction and slip over the corresponding portion of the brake band when the corresponding brake disc rotates in the other direction, when said brake band is engaged with said brake members.

4,345,726

FISHING REEL WITH SPOOL SHAFT BEARINGS

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 4, 1980, Ser. No. 117,988

Claims priority, application Japan, Feb. 15, 1979, 54-18628[U]

The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.

Int. Cl.³ A01K *89/00*

U.S. Cl. 242—212 **3 Claims**

1. A fishing reel comprising,

a pair of first and second side frames, said side frames being opposite to each other at a given interval,

a first bearing supported to said first side frame,

a cylindrical bearing case fixed to said second side frame,

a second bearing supported to said bearing case,

a spool shaft rotatably supported by said first and second bearings, said spool shaft having engaging faces,

a spool mounted to said spool shaft rotatably together therewith,

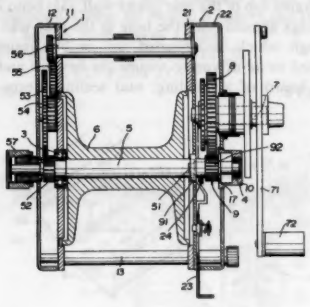
a handle shaft supported to said second side frame,

a driving gear fixed to said handle shaft,

a pinion in mesh with said driving gear, said pinion having a first and a second end portion and being supported axially movably on said spool shaft, said first end portion at the spool side being provided with an engaging portion in mesh with said engaging faces of said spool shaft, said

second end portion at the second bearing side always extending into said bearing case,

a third bearing fixed to the second end portion of said pinion, said third bearing having a round outer periphery adjacent to the inner periphery of said bearing case, said round



outer periphery being slightly smaller in diameter than the inner periphery of said bearing case, so that when said spool shaft deflects said third bearing contacts at said outer periphery with the inner periphery of said bearing case to thereby prevent further deflections of said spool shaft.

4,345,727

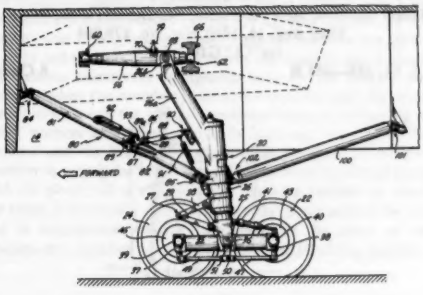
BODY-BRACED MAIN AIRPLANE LANDING GEAR

Robert B. Brown, Kent, and John A. Stepien, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1979, Ser. No. 107,137

Int. Cl.³ B64C *25/12*

U.S. Cl. 244—102 R **6 Claims**



1. A main landing gear assembly for an airplane having a fuselage boy and a wing, comprising:

a shock strut having a first end and a second end and wheel means journalled to said second end of said shock strut, said first end of said shock strut being pivotably and universally attached to said wing of said airplane for universal pivotal movement of said shock strut and said wheel means between a downwardly depending, extended position for taxiing and landing of said airplane and a retracted position;

a foldable drag strut having first and second ends, said first end of said drag strut being pivotably and universally attached to said shock strut at a first position on said shock strut intermediate said first and second ends of said shock strut, said second end of said drag strut being pivotably and universally attached to a first fixed point of said fuselage body, said first fixed point of said fuselage body being inward and forward of said first end of said shock strut, and releasable locking means for maintaining said drag strut in a nonfolded, aligned configuration with said shock strut in said extended position; and,

a rigid radius brace having first and second ends, said first end of said radius brace being pivotably and universally connected to said shock strut at a second position on said shock strut intermediate said first and second ends of said shock strut, said second end of said radius brace being pivotably and universally connected to a second fixed point of said fuselage body, said second fixed point of said fuselage body being inward and rearward of said first end of said shock strut such that said rigid radius brace constrains said shock strut to extend and retract along a predetermined skewed travel path in an inward, upward and forward movement during retraction and a corresponding outward, downward and rearward movement during extension, and whereby said rigid radius brace and said foldable drag strut operate to bear a major portion of drag loads imposed on the extended landing gear assembly.

4,345,728

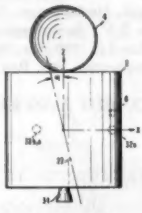
METHOD FOR CONTROLLING THE ATTITUDE OF A SPINNING SPACECRAFT IN THE PRESENCE OF SOLAR PRESSURE

Murray J. Neufeld, Studio City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 880,929, Feb. 24, 1978, abandoned, which is a continuation of Ser. No. 660,089, Feb. 23, 1976, abandoned, which is a division of Ser. No. 551,206, Feb. 19, 1975, Pat. No. 3,996,804. This application Sep. 4, 1979, Ser. No. 71,646

Int. Cl.³ B64G *1/24*

U.S. Cl. 244—168 **3 Claims**



1. Method for compensating for the affects of solar pressure upon a spinning body comprising the ordered steps of:

determining the axial location of the center of solar pressure relative to the center of gravity of the spinning body; and

shifting the center of gravity of the spinning body in the axial direction of said center of solar pressure, to thereby reduce the affects of attitude changing torques inducted by solar radiation.

4,345,729

THRUST UNITS

Arthur J. Barter, Farnborough, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 6, 1980, Ser. No. 175,610

Claims priority, application United Kingdom, Aug. 16, 1979, 7928563

Int. Cl.³ B64G *1/26*; F02G *3/00*

U.S. Cl. 244—169 **9 Claims**

1. A thrust unit for a space vehicle whose attitude is monitored by a space vehicle attitude control system, said thrust unit comprising

a container;

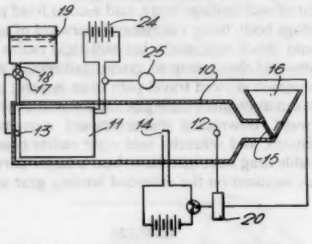
an electrolyzer unit within the container;

means for supplying electrolyte to the electrolyzer unit;

control means responsive to said space vehicle attitude control system for initiating operation of the electrolyzer unit to produce combustible gases from the electrolyte when a change in attitude of the space vehicle is desired;

means for sensing when the pressure within the container reaches a predetermined level;

ignition means for igniting the combustible gases within said container at the predetermined pressure level; and



means for allowing combustion gases to escape from the container to effect a change in attitude of the space vehicle;

said control means being further responsive to said space vehicle attitude control system for terminating operation of said electrolyzer unit when the desired change in attitude of the space vehicle has been completed.

4,345,730

METHOD FOR THE PRODUCTION OF A LINK-BELT AND A LINK-BELT PRODUCED THEREBY

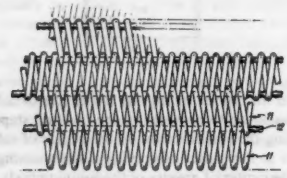
Gerrit W. E. Leuvelink, Haaksbergen, Netherlands, assignor to T. T. Haaksbergen B.V., Haaksbergen, Netherlands

Filed May 14, 1980, Ser. No. 149,692

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921491

Int. Cl.³ B21F *27/00;* B32B *5/00*

U.S. Cl. 245—6 **7 Claims**



1. A link-belt comprising a multiplicity of helical coils joined in side-by-side disposition by respective hinge wires engaged with the interdigitated turns thereof, the material of at least one of the coils and hinge wires being of a synthetic thermoplastic material and being deformed from an initial constant transverse cross-section in the regions in which the said coils and hinge wires lie in close disposition thereby to stabilise the said link-belt.

4,345,731

SEALING MEANS FOR GUTTER HANGER FASTENING MEANS

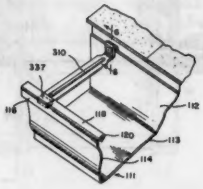
Lacy A. Rowe, 1851 Skycoe Dr., Salem, Va. 24153

Division of Ser. No. 128,727, Mar. 10, 1980, Pat. No. 4,294,423. This application May 15, 1981, Ser. No. 264,203

Int. Cl.³ E04D *13/06*

U.S. Cl. 248—48.2 **1 Claim**

1. Gutter wall fastener nail hole sealing means for use with a rain gutter having a rear wall portion adapted to be secured to a facia board or wall of a building, fastening means for securing the gutter to the building wall, including bracket hanger means provided between the front and rear gutter walls and a headed nail or like headed and sharpened fastening means adapted to be driven through a hole in the rear wall of the gutter and into the facia board; said bracket hanger means including an inverted U-shaped hook or bend portion adapted to fit over the perforated top of the rear gutter wall, said bend portion having openings aligned with the hole in the rear wall of the gutter, through which said headed nail or like fastening means is adapted to be driven to secure the bracket and gutter to the facia board of a building; said sealing means comprising a



compressible strip of elastomeric material adapted to be secured within the U-shaped bend of the hanger bracket extending over the aligned nail hole apertures in the U-shaped bend and in the gutter rear wall, and to be draped over the top of the gutter rear wall, said flexible strip when in place serving as nail hole sealing means when compressed by the headed nail or like fastener when it is driven through the aligned openings in the U-shaped bend and the opening in the top wall portion of the gutter, thereby compressing the strip about the nail hole and preventing leakage of water to the facia board of the building to which the gutter is applied.

4,345,732

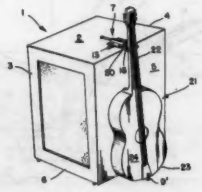
SUPPORTING BRACKET FOR MUSICAL INSTRUMENTS

Manuel Gallegos, 5094 Milwaukee St., Denver, Colo. 80216

Filed Aug. 14, 1980, Ser. No. 178,004

Int. Cl.³ G10G *5/00*

U.S. Cl. 248—441 B **8 Claims**



1. A supporting bracket arrangement for mounting a guitar and other stringed musical instruments having an enlarged body case portion and a relatively narrow projecting finger board portion in an upright position relative to a side wall of a generally rectangular amplifier comprising elongated rods having laterally bent outer ends, said rods being encased in plastic jackets, and generally flat rectangular metal clamping plates associated with said rods and being formed with generally U-shaped channels extending lengthwise thereof of a diameter to snugly and frictionally accommodate said rods therein, said plates having means for flat and opposing attachment thereof to the upper and lower walls of said amplifier, said rods and plates being arranged in at least two opposing units, and said rods being frictionally slidable outwardly in said channels whereby the base portion of said guitar may be supported by a lowermost rod with the finger board portion thereof being hookingly engaged by said uppermost rod and

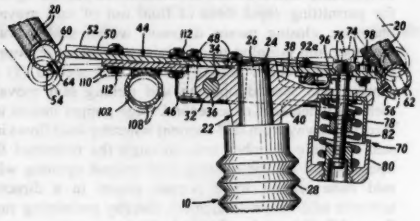
slidable inwardly in said channels whereby said guitar is securely and erectly supported on said amplifier.

4,345,733

MOUNTING DEVICE FOR A CHAIR SEAT

Emilio Ambasz, New York, N.Y., and Giancarlo Piretti, Bologna, Italy, assignors to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Filed Apr. 28, 1980, Ser. No. 144,261
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—561 **4 Claims**



1. A mounting device for a chair seat comprising a generally plate-like support bracket adapted to be mounted generally horizontally on a chair base, a transverse horizontal axle on the support bracket, a seat-mounting member attached to the axle to pivot about the axis of the axle and being adapted to be fastened to the underside of the chair seat, the support bracket and mounting member having mutually engageable surfaces spaced apart from the axle for limiting rearward tilting of the member on the bracket, a spring assembly for restraining the member from tilting forward about the axle, and including a connecting pin connected to and extending down from the mounting member at a location spaced apart rearwardly of the axle, a spring retainer at the lower end of the pin, a hole in the seat-mounting member and support bracket through which the pin passes, a downwardly facing spring seat portion on the bracket, and a compression spring engaged between the spring retainer and the spring seat portion of the bracket, and a blocking member selectively engageable between the bracket and member when the member is tilted forward to keep the member tilted forward, the blocking member being a rod having an offset portion and being pivotably mounted on one of the member and the bracket for movement between an inactive position in which the offset lies generally in a horizontal plane with the pivot axis of the rod and a blocking position in which the offset is vertically displaced from the pivot axis of the rod and in engagement with an abutment on the other of the bracket and member which keeps it in the blocking position.

4,345,734

ADJUSTABLE BASE MOUNT FOR A WALKING-BEAM GAS COMPRESSOR

John Studinger, 1330 Leyden, Suite 134, Denver, Colo. 80220

Filed Aug. 18, 1980, Ser. No. 179,101
Int. Cl.³ F16M *11/00*
U.S. Cl. 248—669 **2 Claims**

1. An adjustable base support for oil well piston pump subjected to high pressures and requiring periodic adjustment of height of the pump cylinder comprising:

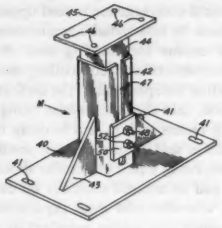
(a) a base plate for securing to a pumping platform,

(b) an outer rectangular tube secured to and upstanding on said base plate, including bracing means for said tube on said base plate, and including a narrow slot in one side extending from adjacent said base plate to the distal edge of the tube forming an open slot,

(c) an inner rectangular tube telescoped in said outer tube with a close fit and having an end extending a short distance beyond the end of said outer tube,

(d) a pump support base secured to the extending end of said inner tube,

(e) locking means for securing said inner and outer tubes in a predetermined telescoped position including a pair of bolts extending through bolt openings in said inner tube and through said slot and having the bolt heads internally



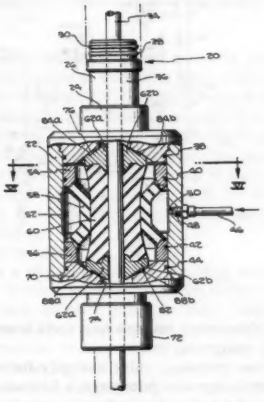
of said inner tube, a pressure plate of substantially the width of the inner tube positioned between the bolt heads and the inner tube wall with the bolt heads welded thereto, and an outer pressure plate of substantially the width of the outer tube mounted on said bolts on the exterior of said out tube, and a nut threadly attached to each said bolt.

4,345,735

BLOWOUT PREVENTER

John Regan, Palos Verdes Peninsula, Calif., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 160,787, Jun. 18, 1980, abandoned. This application Jul. 31, 1981, Ser. No. 288,711
Int. Cl.³ E21B *33/06*
U.S. Cl. 251—1 B **7 Claims**



6. In a blowout preventer apparatus of the type having a resilient and radially compressible annular packing mounted within a housing chamber having axially aligned upper and lower cylindrical bores communicating with the inner bore of said annular packing, said packing resiliently and axially expanding towards said upper and lower bores upon said radial compression, the improvement comprising:

(a) radial sectored end portions of said packing communicating with said upper and lower bores;

(b) a plurality of means, circumferentially arranged upon said sectored ends of said packing and individually movable radially inward into said upper and lower bores, for

controlling said axial expansion, said controlling means comprising

(i) rigid arcuate wedge members circumferentially disposed on said sectored end portions of said packing, and

(ii) a pair of generally conical bores in said housing converging into said upper and lower cylindrical bores, said conical bores forming bearing surfaces for said controlling means and guiding said controlling means into conical convergence in said upper and lower bores in response to said radial compression; and

(c) shoulder means for limiting said sector-wise inward radial movement of said controlling means to a common radial position independent of the uniformity of said radial compression, said shoulder means being disposed on said controlling means and on said housing for mutually abutting contact at said common radial position, said shoulder means comprising a pair of annular shoulders in said conical bores and an arcuate shoulder on each of said wedge members, whereby said axial expansion of said packing material causes said wedge members to progressively and conically converge into said upper and lower bores until said annular and arcuate shoulders mutually abut and said packing seals said inner bore from said upper and lower bores when said inner bore is empty, or until said packing sealingly engages an oil tool in said inner bore.

4,345,736

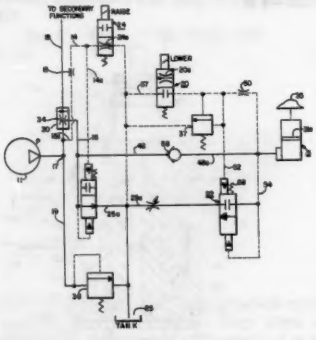
SOLENOID OPERATED VALVE AND DASHPOT ASSEMBLY

Kenneth W. Zeuner, New Hope, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Filed Jan. 21, 1981, Ser. No. 226,689

Int. Cl.³ F16K *31/02*; F15B *13/043*

U.S. Cl. 251—30 **7 Claims**



1. A valve system having a raise and a lower two-stage valve assembly comprising

said raise two-stage valve assembly including a raise first solenoid operated pilot stage, a raise second stage divided into inlet and outlet sections, a raise second stage orifice between the sections within which a raise second stage poppet reciprocates,

said lower two-stage valve assembly including a lower first solenoid operated pilot stage, a lower second stage divided into inlet and outlet sections, a lower second stage orifice between the sections within which a lower and second stage poppet reciprocates,

said raise and lower second stage poppets each having an outer contour to provide a predetermined flow area between the respective orifice and outer contour, said first raise and lower pilot being respectively coupled to said raise and lower second stages by fluid communication for normally maintaining the respective stages opened and closed,

a first dashpot assembly coupled to said lower second stage poppet for first damping only the rate of opening of said lower second stage poppet thereby damping lowering of said load means, and

a second dashpot assembly coupled to said raise second stage poppet for damping only the rate of closing of said raise second stage poppet thereby damping raising of said load means, the second dashpot assembly includes a movable element mounted within a housing, said movable element having a chamber and a first opening for restricting flow of fluid into said movable chamber and a second opening for permitting rapid flow of fluid out of said movable chamber, closing means disposed within said movable chamber and coupled to said raise second stage poppet, said closing means having an enlarged section (1) for closing said second opening and pulling said movable element when said raise second stage poppet moves in a direction away from said element whereby fluid flows into said movable chamber only through the restricted first opening and (2) for opening said second opening when said raise second stage poppet moves in a direction towards said movable element thereby permitting rapid flow of fluid out of said chamber.

4,345,737

LINEAR SOLENOID VALVE ACTUATION DEVICE

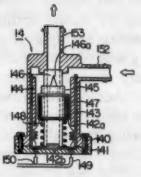
Hisasi Kawai, Toyohashi; Kazuhiro Sakurai, Susono, and Muneaki Matsumoto, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 22, 1980, Ser. No. 123,818

Claims priority, application Japan, Mar. 6, 1979, 54-26344; Apr. 27, 1979, 54-52941

Int. Cl.³ F16K *31/08*; F02M *7/24*

U.S. Cl. 251—129 **6 Claims**



1. A linear solenoid valve actuation device comprising:

a housing having inlet port and outlet port;

a tubular shaft positioned within said housing and having a slit through which said inlet port and said outlet port are communicated;

a spool mounted slidable on said tubular shaft to open and close said slit;

a biasing spring positioned around said tubular shaft to bias said spool;

a permanent magnet positioned around said tubular shaft to provide a magnetic field in a transverse direction to said tubular shaft;

a solenoid winding wound on said spool for moving when energized said spool against the biasing force of said biasing spring;

a pulse generator for generating a train of pulses;

a step signal generator connected to said pulse generator for generating a step signal increasing and decreasing stepwisely in response to said pulses; and

an amplifier circuit connected to said step signal generator for energizing said solenoid winding by an electric current proportional to said step signal, said amplifier circuit including means for generating a constant magnitude

signal which is proportional to frictional hysteresis of said spool on said tubular shaft;

means for either increasing or decreasing said step signal in proportion to said constant magnitude signal upon either increase or decrease of said step signal; and

means for supplying said electric current in proportion to said increased or decreased step signal.

4,345,738

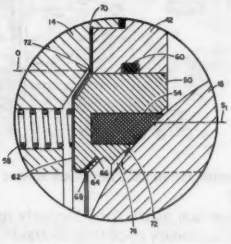
FIRE SAFE SEAL

Roger L. Ripert, Concord, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Aug. 25, 1980, Ser. No. 180,980

Int. Cl.³ F16K 5/00

U.S. Cl. 251—315 **6 Claims**



1. In a valve having a valve body, a closure member mounted in said body for movement between open and closed positions, an internal cylindrical surface in said body adjacent to said closure member, a metallic seat ring slidable in said internal surface, an annular recess in the leading face of said seat ring, a resilient seal ring in and protruding from said recess to seal off fluid flow when urged against said closure member and biasing means urging said seat ring against said closure member; a fire safe seal comprising:

a thin, flexible, annular metallic diaphragm sealed at its outer periphery to said body and at its inner edge to said seat ring;

said diaphragm being interposed between said seat ring and said biasing means; and

a narrow metallic annular sealing ridge integral with and around the leading face of said seat ring within the area circumscribed by said annular recess.

said sealing ridge protruding from said leading face so as to engage against said closure member in absence of said sealing ring while a clearance remains between said closure member and the remainder of said leading face.

4,345,739

FLANGED SEALING RING

Charles Wheatley, Tulsa, Okla., assignor to Barton Valve Company, Shawnee, Okla.

Filed Aug. 7, 1980, Ser. No. 175,937

Int. Cl.³ F16K 3/00

U.S. Cl. 251—358 **1 Claim**

1. In combination with a valve having an annular retaining groove of substantially T-shaped cross-sectional configuration with one open side and a bottom, an annular sealing ring disposed in said groove and comprising a unitary rigid annular core, a resilient covering disposed around the core, an outwardly extending flange provided in the outer periphery of the resilient covering, said rigid core having a width greater than the width of the open side of the groove, said flange extending outwardly through the open side of the groove, said resilient covering having a bulbous surface oppositely disposed with respect to the outwardly extending flange to provide a relatively small area of engagement with the bottom of the groove in an uncompressed condition of the sealing ring and relatively large area of engagement in the compressed condition of the sealing ring, said groove having a surface cooperating with the bulbous surface of said resilient covering whereby a relatively large clearance space for compression is provided between the bulbous surface of the groove surface, and wherein the cross-sectional configuration of the resilient covering is substantially T-shaped and wherein the cross-sectional configuration of the annular core is substantially T-shaped generally corresponding to the cross-sectional configuration of the resilient covering.

4,345,740

TENSIONING SYSTEM FOR CABLES IN PRESTRESSED CONCRETE

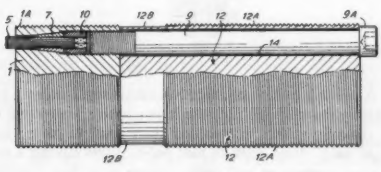
Romualdo Macchi, Via S. Paolo 31, Pisa, Italy

Filed Sep. 19, 1980, Ser. No. 188,721

Claims priority, application Italy, Sep. 28, 1979, 9550 A/79

Int. Cl.³ E04C 5/08

U.S. Cl. 254—29 A **4 Claims**



1. In a system for tensioning strand cables in prestressed concrete of the type having an anchoring head, means defining a plurality of holes in the anchoring head into which an end of each strand or wire extends, anchoring means within each of said hole for anchoring each said end to the anchoring head, a screw-threaded external surface on the anchoring head, a ring threadably engaged with the external surface of the anchoring head for engagement with a support to hold the anchoring head in a position in which the cables are tensioned, the improvement comprising:

an intermediate member;

means defining a plurality of holes extending through the intermediate member, wherein the means defining holes in the intermediate member define as many holes as the means defining holes in the anchoring head, with the holes in the intermediate member being in register with the holes in the anchoring head;

the exterior surface of the intermediate member having an axially extending non-threaded portion between a portion having the screw-threaded exterior surface thereof and the anchoring head for allowing the ring to be disengaged from the thread on the intermediate member and then engaged on the thread of the anchoring head;

rods extending through each said hole defining means in the intermediate member, and screw-threadably engaged with a respective one of the hole defining means in the anchoring head to lock the intermediate member to the anchoring head;

a screw-threaded exterior surface on the intermediate member for engagement with the ring to hold the intermediate member, during tensioning of the cable, in fixed positions;

a thread on the intermediate member for releasable engagement with a jack for tensioning the cable,

whereby the jack and the intermediate member can be removed from the anchoring head when tensioning is complete.

4,345,741

DRIVING PULLEY MECHANISM

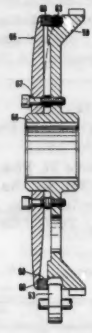
Johannes A. Rinio, 5, Promenade Venezia, Grand Siecle, Versailles, France (7800), and Rodolphe F. Tanson, Moutfort, Luxembourg

Division of Ser. No. 675,876, Apr. 12, 1976, Pat. No. 4,193,311. This application May 14, 1979, Ser. No. 38,773

Claims priority, application Fed. Rep. of Germany, May 17, 1975, 2522033

Int. Cl.³ B66D *1/26*

U.S. Cl. 254—287 **6 Claims**



1. A driving pulley mechanism comprising a driving pulley, especially for multiple purpose hoists with a traversing cable, said driving pulley comprising two pulley parts inclined toward each other, each of said pulley parts having a peripheral edge containing one cable groove part, and wherein the pulley parts are pressed toward each other at the apex of their peripheral edges to form a groove which carries the cable, said parts being pressed by a plurality of elastic pressing devices which are arranged in spaced relationship over the surface of the pulley parts in proximity to the peripheral edge of said pulley parts, and wherein the pulley parts are spread apart during rotation by a spreading device at least at one point opposite the apex carrying the cable, and wherein said pressing devices which press both pulley parts towards each other are coupled for rotation with the driving pulley and rest on both pulley parts.

4,345,742

REGENERATIVE HYDRAULIC INTERLOCK SYSTEM

John B. Morfitt, Langley, Canada, assignor to Lantec Industries Ltd., Langley, Canada

Filed Jun. 20, 1980, Ser. No. 161,601

Int. Cl.³ B66D *1/26*

U.S. Cl. 254—291 **6 Claims**

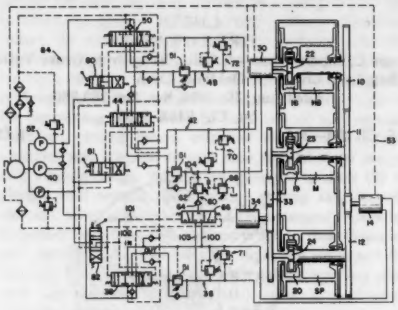
1. A regenerative hydraulically controlled interlock system for logging yarders capable of handling a load using open loop hydraulic circuits, comprising:

at least main and haulback drums and gear means continuously, commonly coupling said drums for mechanically driving said drums simultaneously;

primary drive means for powering said main and haulback drums simultaneously generally in opposite directions, said primary drive means including a motor in a primary open loop hydraulic power circuit;

hydraulic interlock drive means including an interlock motor coupled to said haulback drum for selectively varying the speed and/or direction of said haulback drum relative to the main drum;

a secondary open loop hydraulic power circuit coupled to said hydraulic interlock drive means, said hydraulic interlock drive means regeneratively producing pressurized hydraulic fluid to said secondary open-loop hydraulic



power circuit when said interlock motor is driven by said load; and

selective diversion means for selectively hydraulically coupling said secondary open loop hydraulic power circuit to said primary open loop hydraulic power circuit for supplementing said primary open loop hydraulic power circuit.

4,345,743

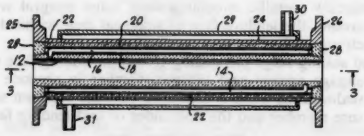
MEANS AND METHOD FOR CONTAINING FLOWING OR STANDING MOLTEN METAL

Olivo G. Sivilotti; John Sulzer, both of Kingston, and Alan F. Treganza, Sydenham, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Oct. 10, 1980, Ser. No. 196,100

Int. Cl.³ C21C *5/46*; C22B *9/00*

U.S. Cl. 266—44 **10 Claims**



1. A method of containing molten metal, comprising:

a. disposing the molten metal, at a predetermined temperature value, in a predetermined space while

b. maintaining refractory lining material beneath, above and alongside the metal, in defining relation to said space, to surround the molten metal, and while

c. supplying heat to substantially all exterior surfaces of said lining material, and

d. controlling said supply of heat to maintain the temperature of said exterior surfaces at least at about said predetermined value; the aforesaid method being one in which:

e. at a later time molten metal is drained from said space, to empty the space, and in which

f. during said later drainage of metal from the space, said supply of heat to the exterior surfaces of the lining material is maintained to keep said exterior surfaces at said predetermined temperature value until said metal has substantially all been drained away, whereby metal thereafter remaining and solidifying on the refractory lining material is at most a paper-thin layer.

4,345,744

WORKING MACHINE WITH FLAME CUTTER AND COOLING UNIT

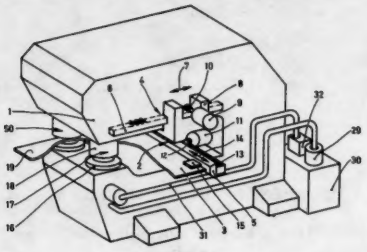
Berthold Leibinger, Gerlingen, and Hans Klingel, Möglingen, both of Fed. Rep. of Germany, assignors to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,375

Claims priority, application Fed. Rep. of Germany, May 11, 1980, 3041621; Aug. 30, 1980, 3032729

Int. Cl.³ B23K 7/00, 7/10

U.S. Cl. 266—49 43 Claims



1. A machine for working flat workpieces comprising:

a frame;

a flame cutter connected to said frame for directing a cutting jet to one side of a workpiece which penetrates the workpiece;

a mechanism connected to the frame for moving the workpiece past the cutting jet; and

cooling equipment connected to the frame having an opening space facing said flame cutter for receiving the jet which has penetrated a workpiece, and having means for circulating a coolant in the opening space to receive the jet which has penetrated the workpiece.

4,345,745

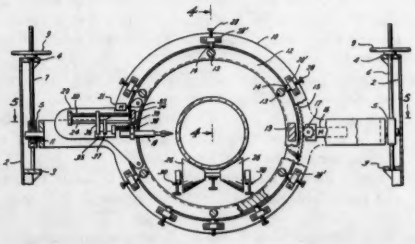
PIPE CUTTER FOR END CUTS OF TUBULAR MATERIAL

Richard J. Steele, 2202 Harwell, Houston, Tex. 77026

Filed Aug. 13, 1981, Ser. No. 292,407

Int. Cl.³ B23K 7/04

U.S. Cl. 266—56 6 Claims



1. In a pipe cutting device, a pair of annular torch supporting members, a cutting torch mounted on said members, a vertically adjustable annular member adapted to concentrically receive said torch supporting members, means for rotating said torch supporting members in a selected path of rotation.

4,345,746

APPARATUS FOR REFINING FERROUS MELT WITH SLAG CONDITIONING

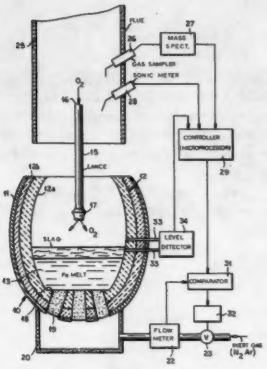
Francois Schleimer, Dudelange; Romain Henrion, Esch; Ferdinand Goedert, Dudelange; Lucien Lorang, Differdange, and Jean Baumert, Esch, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 204,537, Nov. 6, 1980. This application May 4, 1981, Ser. No. 261,509

Claims priority, application Luxembourg, Nov. 7, 1979, 81859

Int. Cl.³ C21C 5/30

U.S. Cl. 266—90 5 Claims



1. The combination with a steel-refining vessel containing a slag overlying a melt of a metal to be refined, a lance for blowing oxygen onto the surface of the melt, and means for bubbling an inert gas through said melt from the bottom thereof, of:

a control system including hydrostatic means for measuring the level of said slag, sound-responsive means for measuring the consistency of said slag, and gas-analysis means responsive to gas above said slag, each of said means generating a signal, and control means responsive to at least one of said signals for regulating the rate of flow of inert gas to said melt.

4,345,747

FILLING STAND FOR POURING MOLTEN METAL FROM A TILTABLE METALLURGICAL VESSEL INTO A METALLURGICAL LADLE

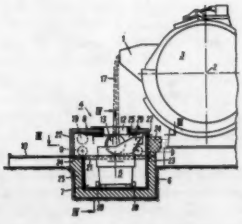
Friedrich Laimer, Perg, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 16, 1980, Ser. No. 169,417

Claims priority, application Austria, Aug. 9, 1979, 5430/79

Int. Cl.³ C21B 7/14

U.S. Cl. 266—240 12 Claims



1. In a filling stand arrangement to be used for pouring molten metal from a tiltable metallurgical vessel into a metallurgical ladle, for example for pouring molten pig iron from a

pig iron mixer into a transporting ladle, and of the type including a tiltable metallurgical vessel including an outlet for pouring out a molten metel jet, a metallurgical ladle, a casing surrounding said metallurgical ladle and comprised of a casing lower portion and a casing upper portion, at least one exhaust conduit being connected to said casing, and a pour-in opening for receiving the molten metal jet provided in said casing upper portion below said outlet of said tiltable metallurgical vessel, the improvement which is characterized in that at least a part of the casing that includes said pour-in opening is displaceable in the tilting plane of said tiltable metallurgical vessel by a distance related to a change in the position of said molten metal jet streaming out of said outlet of said tiltable metallurgical vessel.

4,345,748

FLUID DAMPED UNIT, PARTICULARLY FOR USE AS SHOCK ABSORBER OR TELESCOPIC STRUT

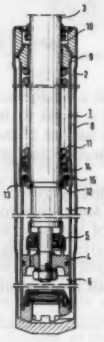
Felix Wössner, Schweinfurt; Günther Handke, Euerbach, and Manfred Koller, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,515

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853914

Int. Cl.³ B60G *13/06, 15/12*

U.S. Cl. 267—8 R **32 Claims**



1. A fluid damped unit particularly suitable as a shock absorber comprising a cylinder, a piston rod positioned within said cylinder and arranged for extending and retracting movement from one end of said cylinder, means located at said one end of said cylinder for guiding said piston rod and sealing said cylinder, a piston fixed to said piston rod near the end of said piston rod within said cylinder, said piston dividing the interior of said cylinder into a first annular work chamber adjacent said guiding and sealing means and a second work chamber adjacent the end of said cylinder which is opposite said guiding and sealing means, a fluid charge in said cylinder, wherein said piston rod can be reciprocated between a fully retracted position and a fully extended position relative to said cylinder, and damper means arranged in said first annular work chamber for damping the movement of said piston rod, said damper means arranged to create a damping force applied against said piston rod during a portion of its movement intermediate said fully retracted and fully extended positions and including throttling fluid passage means located within said first work chambers and dividing said first work chamber into two annular chamber sections, said damper means also comprising a compression spring which surrounds said piston rod, said compression spring having one end facing toward said guiding and sealing means which bears against one of said guiding and sealing means and said cylinder, damping ring means including a damping ring carrier arranged at the other end of said compression spring to divide said first annular work chamber into said two annular chamber sections, a damping ring arranged in said damping ring carrier to frictionally contact the inner circumferential surface of said cylinder and being axially movable relative to said damping ring carrier between a pair of end positions, one of said end positions being closer to said piston and the other end position being more remote from said piston, said damping ring reducing the flow cross section of said throttling fluid passage means when located in the one of said end positions and increasing the flow cross section of said throttling fluid passage means when located in the other said end position, and said damping ring carrier is fixed to said compression spring, and stop means mounted for movement together with said piston rod.

4,345,749

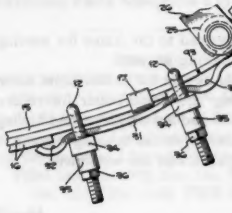
MULTIPURPOSE SPLINT MEANS FOR SPRING LEAF ASSEMBLIES

Donald J. Hellwig, Exeter, Calif., assignor to Hellwig Products Company, Inc., Visalia, Calif.

Filed Jul. 28, 1980, Ser. No. 172,984

Int. Cl.³ F16F *1/26*

U.S. Cl. 267—51 **1 Claim**



1. A multipurpose splint means for at least temporary repair of a broken leaf element of a spring leaf assembly, comprising:

an elongated flexible generally arcuate member of spring steel having correspondingly curved opposite elongate surfaces;

said arcuate member including an intermediate portion of selected length,

an end portion providing a transverse recess means,

a corresponding transverse recess means at the opposite end of the intermediate portion,

said recess means being curved in the same direction and adapted to provide positioning means for securement members in one application of the arcuate member to a leaf spring assembly,

an opposite end portion integral with said recess means at the opposite end of the intermediate portion and curving through a radius of about 90° and adapted to cradle an end eye of a main spring leaf in another application of the arcuate member to a leaf spring assembly,

said recess means, intermediate portion, and said opposite end portion providing on one elongate surface spaced convex faces,

the convex face of the intermediate portion including a central face portion lying exteriorly beyond a plane tangent to the convex faces of the contiguous recess means,

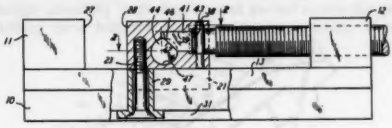
said convex faces of the recess means and intermediate portion forming spaced concave indentations adapted to position securement members in said another application of the arcuate member to a leaf spring assembly.

4,345,750

VISE

Hans F. Glaser, 6533 Greenridge Dr., Racine, Wis. 53406

Filed Feb. 2, 1981, Ser. No. 230,525
Int. Cl.³ B23Q 3/02
U.S. Cl. 269—136 1 Claim



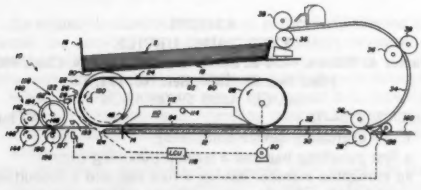
1. A vise comprising a base of an upright U-shape with two spaced apart abutments and an interconnecting portion extending between and offset with respect to the center line between said abutments, a block slidable on said interconnecting portion and along said center line and having a clamp surface facing one of said abutments for clamping a work piece with said one abutment a cylindrical pin in said block and extending in said transverse direction and having a flat angled surface thereon faced away from said interconnecting portion, a wedge on said block and in contact with said screw and said pin and having a surface mated with said flat angled surface, said mated surfaces being disposed at an elevation lower than the center line of contact of said screw and said wedge for urging said block downwardly onto said interconnecting portion, a screw threadedly mounted in the other of said abutments and in abutment with said wedge in said block for forcing said block toward said one abutment in the clamping action, said block and said interconnecting portion having a three-sided mated rail relationship therebetween for the sliding of said block on said interconnecting portion and the avoidance of movement of said block transverse to said center line, said interconnecting portion having a slot extending therein parallel to and on the plane of said center line, a connector attached to said block and extending through said slot and in sliding relation with said interconnecting portion for guiding said block on said interconnecting portion, said connector being offset on said block to the side thereof intermediate said one abutment and said mated surfaces, the projected area of said block on the plane in the direction transverse to said center line being less than the corresponding projected area of each of said abutments and thereby said block having clearance with the planes extending parallel to said center line and between the respective edges of said abutments for clamping of said vise across said abutments while having clearance for the sliding movement of said block.

4,345,751

SHEET FEEDING APPARATUS

Ronald C. Holzhauser, Holley, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1980, Ser. No. 172,339
Int. Cl.³ B65H 5/22
U.S. Cl. 271—3.1 13 Claims



1. Sheet feeding apparatus for feeding sheets seriatim from a stack of sheets in a tray or the like, the apparatus comprising:

an oscillating vacuum tube located adjacent the tray, the tube having a plurality of ports extending through the outer surface of the tube and having means for applying a vacuum to the ports so that a sheet in the tray can be tacked to the tube surface by vacuum and partially removed from the tray upon oscillation of the tube, the tube comprising a plurality of spaced tube sections and means interconnecting the sections for effecting conjoint oscillating movement of the sections about an axis;

at least one endless vacuum belt having a plurality of openings therethrough, a portion of the belt being disposed between two adjacent sections of the vacuum tube;

means for applying a vacuum through openings in the belt; and

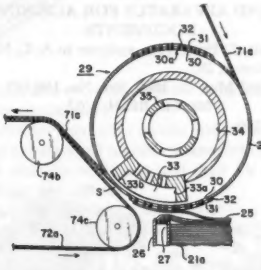
means supporting the belt for movement along an endless path, the supporting means locating the belt relative to two adjacent sections of the tube so that the path traveled by the belt extends between the tube sections and is recessed beneath the tube surface at the portion of the tube sections nearest the tray and the belt path then projects from the tube sections and above the tube surface, whereby a sheet removed from the tray by the tube is transferred to the belt upon oscillation of the tube.

4,345,752

SHEET TRANSPORT APPARATUS

Kunihiko Nakamura, and Hiromi Miyaji, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 138,676, Apr. 9, 1980, abandoned. This application Jan. 29, 1981, Ser. No. 230,887
Claims priority, application Japan, Apr. 20, 1979, 54-48713; Oct. 25, 1979, 54-137966
Int. Cl.³ B65H 5/08
U.S. Cl. 271—12 8 Claims



1. A sheet transport apparatus comprising:

means for maintaining a stack of sheets with the topmost sheet of said stack at a predetermined position;

suction drum means supported adjacent said topmost sheet of said stack with a clearance therebetween at the leading edge portion of said topmost sheet for picking up said topmost sheet in the transport direction, said drum means comprising a rotatable cylindrical member with an elongated apertured zone in its curved surface, the peripheral length of said apertured zone being less than the length of said sheets; a stationary suction chamber positioned within said cylindrical member and extending along the inner surface of said cylindrical member, said stationary suction chamber having an opening which opens adjacent to the inner surface of said cylindrical member for picking up said topmost sheet of said stack when the leading end of said apertured zone of said cylindrical member passes by said opening of said suction chamber; and means for rotating said cylindrical member in a manner that the periphery of said cylindrical member facing to the leading edge portion of said topmost sheet moves in the transport direction, said rotating means rotating said cylindrical member

in a cyclic operation of acceleration-deceleration and in such a relation that said leading end of said apertured zone of said cylindrical member is substantially aligned with the leading edge of said topmost sheet of said stack when said cylindrical member reaches the minimum speed in its cyclic operation; and

means for conveying said picked-up topmost sheet away from said suction drum means, said conveying means comprising a pair of constant speed belt conveyor devices defining first and second conveying paths and an entrance area therebetween in such a manner that the conveying belts gradually approach each other in the transport direction initially making frictional contact with the leading edge of a sheet picked up and fed by said suction drum means while the traveling speed of said belt conveyor devices exceeds the peripheral speed of said cylindrical member and while the trailing portion of the sheet is still under suction by the suction drum means whereby said sheet is flattened and then becomes contiguous with said belts, and thereafter said conveying belts grasping the leading edge of said picked-up sheet, said second conveying path and said first conveying path thereafter being the same while the conveying belts travel contiguously in the transport direction;

the maximum peripheral speed of said cylindrical member being selected nearly equal to the travelling speed of said conveying belts; and

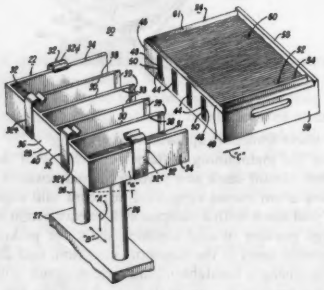
said sheet being grasped at the leading edge between said conveying belts and released from said suction drum when the peripheral speed of said cylindrical member reaches the maximum speed.

4,345,753

PROCESS AND APPARATUS FOR ALIGNING PAPER DOCUMENTS

Robert Marshall, El Paso, Tex., assignor to A. C. Nielsen Company, Northbrook, Ill.

Filed May 16, 1980, Ser. No. 150,567
Int. Cl.³ B65H *3/62*
U.S. Cl. 271—146 **11 Claims**



1. A paper jogger comprising:

a vibratory mechanism;

a vibratory support connected to said vibratory mechanism;

a paper tray for holding a plurality of paper documents to be jogged, said tray being releaseably securable to said vibratory support; and

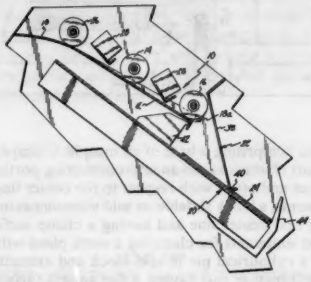
dividing means removably receivable within said tray for dividing said paper documents into discrete portions, said dividing means including a plurality of splines extending outwardly of said vibratory support, said tray including a plurality of elongated slots formed therein through which said splines are received in said tray.

4,345,754

PHOTOGRAPHIC STACKING DEVICE

Armer J. Willenbring, Bloomington, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Oct. 27, 1980, Ser. No. 200,933
Int. Cl.³ B65H *31/00*
U.S. Cl. 271—209 **3 Claims**



1. A photographic print stacking device for stacking individual photographic prints, each print having an image-bearing surface and a non-image-bearing surface, on a print tray as they are discharged in a machine direction from a discharge end of a print conveying apparatus, the device comprising:

a print slide positioned proximate the discharge end and generally above a print tray for receiving and discharging individual photographic prints with the non-image-bearing surface adjacent the print slide as the prints are driven in the machine direction, the print slide having a substantially flat central portion and a pair of downwardly and inwardly sloping side portions, sloping toward the central portion of such that the print slide has a concavely bowed surface in a transverse direction for engaging the prints and having a print slide discharge end;

drive roller means for drivably engaging a central portion of the image-bearing surface of each photographic print for discharging each print off the print slide, the drive roller means being positioned above the substantially flat central portion of the print slide proximate the print slide discharge end to cause the prints to generally conform to the concave bow of the print slide in a transverse direction by deflecting side portions of each print upwardly with the side portions of the print slide as each print is discharged from the discharge end of the print conveying apparatus; and

a central deflector downwardly deflecting each print toward the print tray onto a print stack after each print is discharged from the print slide, the central deflector having an upper end portion attached proximate the print conveying apparatus and positioned proximate the print slide discharge end to deflect each print upon discharge from the print slide.

4,345,755

EXERCISING DEVICE

James A. Eidson, 4430 E. Sheila St., Los Angeles, Calif. 90023

Filed Sep. 29, 1980, Ser. No. 191,705
Int. Cl.³ A63B *69/00, 69/24*
U.S. Cl. 272—78 **9 Claims**

1. An exercising device comprising:

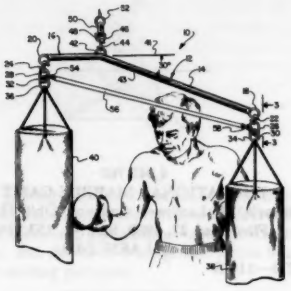
a first punching bag and a second punching bag;

an elongated member having a first end and a second end, said first end being spaced from said second end, said elongated member having an upper surface and a lower surface;

a first hanger assembly connected to said first end on said lower surface, said first hanger assembly being connected

to said first punching bag, said first hanger assembly including first swivel means for permitting three hundred and sixty degree rotation of said first punching bag relative to said elongated member;

a second hanger assembly connected to said second end on said lower surface, said second hanger assembly being connected to said second punching bag, said second hanger assembly including second swivel means for permitting three hundred and sixty degree rotation of said



second punching bag relative to said elongated member; and

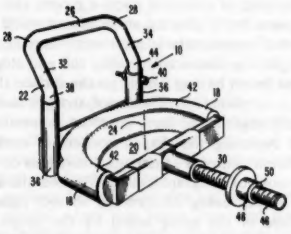
a third hanger assembly connected to said elongated member on said upper surface, said third hanger assembly being located intermediate said first and second ends, said third hanger assembly being connected to a supportive member, said third hanger assembly including third swivel means for permitting swiveling of said elongated member relative to said supporting member.

4,345,756

ADJUSTABLE DUMBBELL APPARATUS

Jesse Hoagland, 333 Bellevue Ave., Trenton, N.J. 08618

Filed Dec. 1, 1980, Ser. No. 211,879
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **8 Claims**



1. An adjustable dumbbell apparatus, particularly adapted to maintain the arms of the exerciser in a straight orientation when used with weighted members, which comprises:

(a) a circumferential member defining a hole therein through which the arm of the exerciser extends, said hole defining a hole axis therethrough extending through the center of said hole perpendicular to a plane defined by said circumferential member;

(b) a strut means being fixedly secured with respect to the inner side of said circumferential member and extending upwardly therefrom approximately parallel to said hole axis to extend along the forearm and wrist area of an exerciser;

(c) a grip means detachably secured with respect to said strut means and including a horizontal portion thereof extending approximately perpendicular with respect to said strut means to provide a location for grasping by the hand of the exerciser; and

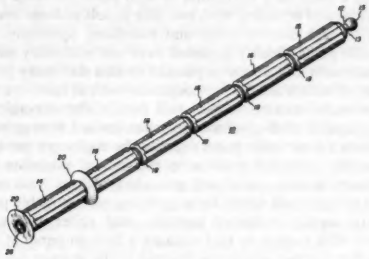
(d) a weight support member being fixedly secured with respect to said cicumferential member at a location opposite from said strut means and extending therefrom approximately perpendicular with respect to said hole axis and with respect to said strut means and said grip means, said weight support means adapted to receive variously weighted members secured thereon to control the intensity of the exercise.

4,345,757

ANCHORED MASSAGE AND EXERCISING BAR

Raymond J. Lo Voi, 828 Liberty La., Rockaway Point (Queens), N.Y. 11697

Filed Dec. 4, 1979, Ser. No. 100,009
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—127 **2 Claims**



1. A massage and exercising system comprised of:

at least one central shaft;

a handle rotatably mounted on one end of each shaft;

a ball joint having a ball member connected to the other end of each shaft for anchoring said shaft for pivotal movement about said other end;

a plurality of massage rollers mounted on each shaft between the handle and the ball joint so as to be individually rotatable thereon;

a stationary plate which is fastened to a relatively immovable object, said stationary plate having at least one opening therein for each shaft to be anchored, each opening consisting of a rounded portion for accepting the ball member and a straight channel portion extending horizontally from the rounded portion, said straight portion having a width smaller than the diameter of the ball member for the captured movement of the ball member to the distal end of the channel; and

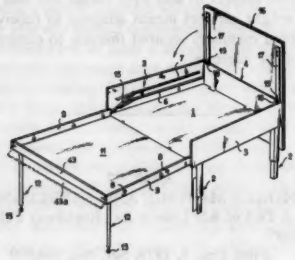
a movable plate which is slideably mounted with regard to the stationary plate so as to be operable between an advanced and a retracted position, said movable plate having at least one opening consisting of a second rounded portion for accepting the ball member and a second horizontal channel portion extending from the second rounded portion and turning vertically at its distal end to form an "L" shape, said second rounded portion and said second horizontal channel being aligned with the opening(s) of the stationary plate when the movable plate is in its retracted position so that the ball member can be inserted through both rounded portions and slid horizontally along the channel portions to their distal ends thereby positioning said ball member to be captured when the movable plate is moved to its advanced position.

4,345,758

CONVERTIBLE TABLE, ESPECIALLY FOR GAMES

Bertrand Kempf, 46, rue des Martyrs, 75009 Paris, France

Filed Feb. 20, 1980, Ser. No. 123,189
Claims priority, application France, Mar. 1, 1979, 79 05352
Int. Cl.[3] A63B *61/00*
U.S. Cl. 273—30 **11 Claims**



1. A convertible table primarily intended for games, comprising a stationary horizontal bottom panel mounted on four rigid legs and provided with two side panels and one end panel fixed to said bottom panel and extending upwardly, and a movable panel slidably mounted over said stationary panel for displacement in a direction parallel to said stationary panel by means of rollers adapted to cooperate with at least one pair of roller tracks secured to said side panels, the movable panel being capable of displacement from an inward storage position in which the movable panel overlies the stationary panel to an outwardly extended position in the line of extension of the stationary bottom panel and provided with at least one leg fitted with a small wheel for supporting said movable panel in said outwardly extended position, said roller tracks being placed with respect to said stationary bottom panel at a level such that the two panels are located in the storage position at a vertical distance from each other which permits storage of objects on said stationary bottom panel and said movable panel, said table further comprising a cover resting on said side panels for providing protection above said movable panel when said movable panel is in said storage position, said cover comprising two table-top panels joined to each other by means of a transverse hinge adjacent to that side of the table from which the movable panel is outwardly extensible, removable spacer members being provided for extending said at least one leg of the movable panel and receiving the unfolded table-top panel when said movable panel is in the outwardly extended position.

4,345,759

BASKETBALL

Dean L. Nims, 680-59th St., Des Moines, Iowa 50312

Filed Nov. 2, 1979, Ser. No. 90,680
Int. Cl.[3] A63B *41/00*
U.S. Cl. 273—65 R **7 Claims**

4. A conventional basketball including a plurality of panels therearound and having indicia means extending transversely across the panels and substantially around the ball at the center and giving the appearance of a continuous 360° line when the ball is rotated uniformly, for sighting and aligning with the basket and providing feedback data on how the ball was shot relative to being shot with the hand launching it squarely which imparts rotation about an axis of rotation through the ball that is stationary relative to the ball, said indicia means allowing the ball to be oriented in the shooter's hand with the indicia means on the ball in a vertical plane and on the line of intended flight to the basket.

4,345,760

EDUCATIONAL MARBLE GAME

John J. Kovach, 189 Landover, Gahanna, Ohio 43230

Filed May 27, 1980, Ser. No. 153,174
Int. Cl.[3] A63F *7/00*
U.S. Cl. 273—118 R **6 Claims**

1. A game apparatus for teaching and learning geography, comprising:

a. a plurality of spherical playing pieces; and

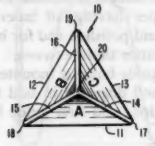
b. a game board playing surface, composed of a portable sheet of carpet material sufficiently hard and textured that the playing pieces will readily roll and stop thereon, the game board having indicia on the surface thereof, including a combination of assorted straight and curved lines joined together to form contours representing, defining, and depicting the shaped borders of enclosed areas of different contours of unnamed divisions or unnamed subdivisions of geographical significance, the spherical playing pieces being constructed to roll upon the playing surface of the game board by the projection of game players and to come to rest upon the surface of the game board within the shaped borders of the enclosed areas of the unnamed divisions or unnamed subdivisions and to strike other spherical playing pieces, and to propel them across the playing surface causing them to come to rest within or without the shaped borders of the enclosed areas of the unnamed divisions or unnamed subdivisions, and the game board being devoid of recesses capable of capturing the spherical playing pieces;

according to the rules and procedures of the game played upon the surface with the spherical playing pieces which allows the players to capture the spherical playing pieces according to skill in detecting the shape and naming the divisions or subdivisions in addition to skill in projecting the spherical playing pieces.

4,345,761
TETRAHEDRAL GAMING DIE WITH RECESSED PYRAMIDAL FACES

David B. China, Shobola, Pa., assignor to Bermas Plastics Co., Inc., Long Island City, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,239
Int. Cl.³ A63F 9/04
U.S. Cl. 273—146 8 Claims

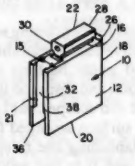


1. A novel gaming die which is in the form of an equilateral tetrahedron, characterized in that each of the four sides has the same form of a recessed triangular pyramid having three congruent facets, and the twelve congruent facets bear various markings for scoring purposes.

4,345,762
ASSEMBLY TOY

Yaacov Lebelson, 24 Hahalutzim St., Tel Aviv, Israel

Filed Nov. 18, 1980, Ser. No. 207,872
Claims priority, application Israel, Dec. 3, 1979, 58844
Int. Cl.³ A63F 9/12
U.S. Cl. 273—157 R 14 Claims



1. An assembly toy comprising at least first and second elements, said first element having a male attachment protrusion disposed along an edge thereof and said second element having defined along an edge thereof a female socket, the protrusion and the socket being configured to permit selectable press fit and slidable engagement therebetween;

said at least first and second elements each being formed of a pair of parallel disposed flat surfaces arranged in generally co-extensive spaced relationship and defining first, second, third and fourth edges;

said pair of surfaces being joined along at least part of said first and second edges and being separated from each other along said third and fourth edges thereby to permit flexibility between said pair of surfaces at said third and fourth edges;

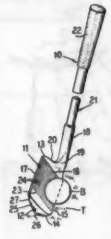
said male attachment protrusion being disposed along said first edges and defining a generally elongate protrusion including an end portion having generally parallel planar side protrusion surfaces extending parallel to said pair of surfaces and a narrowed neck portion joining said end portion to said first edge;

said female socket being defined by said pair of surfaces at said third edges, said female socket also comprising flange means extending inwardly from said pair of surfaces for selectable retaining of said male attachment protrusion, at least one of said protrusion and flange means including bevelled surfaces being so directed as to enable ready press fit engagement and disengagement of said protrusion and socket during generally coplanar motion therebetween.

4,345,763
GOLF CLUB

Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025

Filed Dec. 8, 1981, Ser. No. 328,633
Int. Cl.³ A63B 53/00
U.S. Cl. 273—164 11 Claims

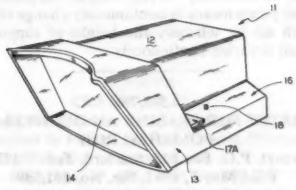


1. A lofted golfing iron having a visible top sighting edge on the blade thereof to facilitate alignment of the club for the intended flight path of the ball and having an enhanced size striking face which comprises a blade having heel and toe ends of substantially the same height, a thick bottom sole with a front edge, an upright back face, a top edge parallel with said front edge and an inclined front striking face between said bottom and top edges extending from the heel to the toe ends, a hosel extending upwardly and forwardly from the heel end of the blade, a flattened land connecting the bottom of the hosel with the bottom portion of the heel end of the blade and said top edge of the blade being thinner than the remaining portion of the blade and defining the aforesaid sighting line.

4,345,764
HAND-HELD ELECTRONIC GAME

Gordon A. Barlow; John R. Krutsch, both of Glenview, and Richard A. Karlin, Chicago, all of Ill., assignors to Gordon Barlow Design, Skokie, Ill.

Filed Jan. 30, 1980, Ser. No. 116,835
Int. Cl.³ A63F 9/00
U.S. Cl. 273—313 22 Claims



1. A hand-held programmed electronic game for playing by individuals holding said electronic game,

said game comprising first electronically controlled lights for depicting invaders and bombs,

second electronically controlled lights for depicting defenders and death rays,

third electronically controlled lights visually interposed between said electronically controlled lights depicting said defenders and said electronically controlled lights depicting invaders for depicting barriers impenetrable by said bombs and death rays,

said first and second electronically controlled lights affixed in first and second planes respectively, and

means for causing individuals to see said first, second and third electronically controlled lights in a single plane.

4,345,765

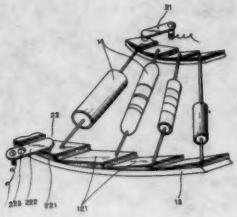
MOVING TARGET MEANS OF SHOOTING GALLERY

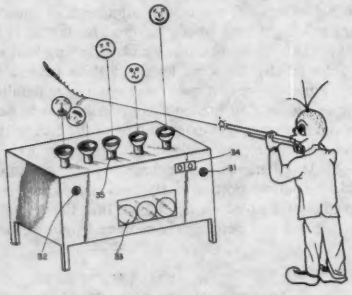
Austin Wang, No. 3, 5th Alley, 5th La., 1st Sec. Chung-Ching S. Rd., Taipei, Taiwan

Filed Jul. 9, 1980, Ser. No. 166,900

Int. Cl.³ F41J *9/02*

U.S. Cl. 273—359 **8 Claims**





1. A moving target mechanism for shooting galleries comprising:

a plurality of air pump means for producing a plurality of individual vertical air-jets;

a lightball supported on each air jet; and

means for continuously varying the current passing through each air pump means to continuously change the flow rate of each air jet whereby the height of support of each lightball is varied continuously.

4,345,766

APPARATUS FOR SEALING AN OIL WELL PUMP POLISHED ROD

Sandor Turanyi, P.O. Box 845, Stafford, Tex. 77477

Filed May 7, 1981, Ser. No. 261,539

Int. Cl.³ E21B *33/08;* **F16J** *15/56*

U.S. Cl. 277—30 **5 Claims**

1. An apparatus for effecting a seal with a reciprocating polished rod member of substantially constant diameter to block leakage of fluid therebetween, including:

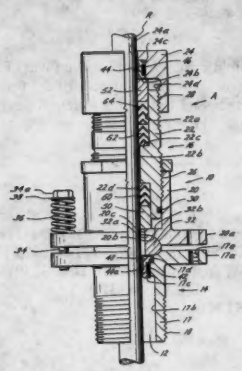
a substantially tubular housing having a longitudinal bore extending therethrough in which said substantially constant diameter reciprocating polished rod member is positioned for sealing therewith, said tubular housing having means for operably securing with a wellhead of the a hydrocarbon producing well having the polished rod member extending therefrom;

said tubular housing having a first tubular housing portion and a second tubular housing portion, said second tubular housing portion connected with said first tubular housing portion by means for enabling limited relative angular movement therebetween, said first housing portion securable with the wellhead;

a first polished rod scraper disposed in said bore and movably mounted with said first housing portion, said first rod scraper having an inner surface disposed closely adjacent said polished rod for blocking passage of undesired solid matter therebetween;

a second polished rod scraper disposed in said bore and movably mounted with said second housing portion, said second rod scraper having an inner surface disposed closely adjacent said polished rod for blocking passage of undesired solid matter therebetween;

a first polished rod guide bushing mounted with said second housing portion and disposed in said bore adjacent said first housing portion, said first guide bushing having an



inner surface arranged for contacting said polished rod for establishing the relative radial relationship therebetween;

a second polished rod guide bushing mounted with said second housing portion and disposed in said bore adjacent said second polished rod scraper, said second guide bushing having an inner surface arranged for contracting said polished rod for establishing the relative radial relationship therebetween, said first and second guide bushings spaced apart a sufficient distance for maintaining said second housing portion longitudinally aligned with said polished rod; and

means mounted with said second housing portion and disposed in said bore between said first and said second guide bushings for effecting a sliding seal between said second housing portion and the polished rod to block leakage of wellhead fluid therebetween.

4,345,767

FLUID SEAL ELEMENT FOR COMPRESSED AIR FILTER

Brian P. Neal, Kingswood, England, assignor to Bendix Westinghouse Ltd., Bristol, England

Filed Jun. 30, 1980, Ser. No. 164,111

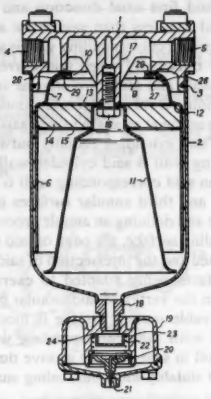
Claims priority, application United Kingdom, Aug. 2, 1979, 7926885

Int. Cl.³ F16T *1/14;* **B01D** *27/10;* **F16J** *15/00*

U.S. Cl. 277—12 **1 Claim**

1. A fluid pressure unit comprising a housing having an input port and an outlet port, an internal member for carrying a filter element, said internal member having a generally bell-shaped section with an axial aperture, an annular seal element for said aperture comprising a generally "U"-shaped section to provide two lips, one disposed outside the bell-shape and one inside the bell section, one lip longer than the other, the bell-shape having at least one further aperture covered by the longer said lip and means mounting said internal member whereby connec-

tion between the inside and outside via said aperture is closed by a seal effected by the shorter said lip, the longer said lip



being deflectable to provide a bypass via the further aperture in the event of a pressure build-up on one side thereof.

4,345,768

SELF PUMPING SEAL FOR A RECIPROCATING MEMBER

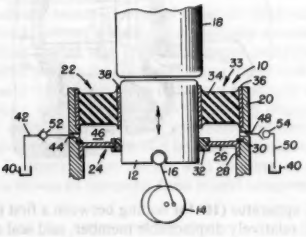
Michael A. Roussin, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00918, § 371 Date Oct. 29, 1979, § 102(e) Date Oct. 29, 1979, PCT Pub. No. WO81/01182, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 29, 1979, Ser. No. 108,907

Int. Cl.³ F01B *19/02;* **F04B** *45/04;* **F16J** *15/56*

U.S. Cl. 277—22 **12 Claims**



1. In a seal arrangement for a device having a housing **(20)**, and a reciprocating member **(12)** mounted in said housing **(20)**, the improvement comprising:

first seal means **(24)** for sealingly associating the reciprocating member **(12)** with said housing **(20)**;

second seal means **(33)** for sealingly associating the reciprocating member **(12)** with said housing **(20)** and forming a substantially fluid tight variable volume cavity **(46)** with said first seal means **(24)**;

a source of cooling fluid **(40)**;

means **(42,52,44)**, for communicating said source of cooling fluid **(40)** to said variable volume cavity **(46)**.

4,345,769

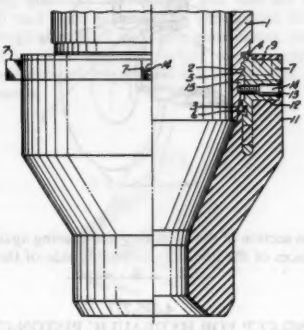
DRILLING HEAD ASSEMBLY SEAL

Paul R. Johnston, Washington, Pa., assignor to Washington Rotating Control Heads, Inc., Washington, Pa.

Filed Mar. 16, 1981, Ser. No. 244,026

Int. Cl.³ F16J *15/56*

U.S. Cl. 277—31 **4 Claims**



1. In a drilling head assembly for rotary well drilling, a vertically extending tubular member provided with an external screw thread adjacent to but spaced above its lower end, the outer surface of said member below said screw thread tapering downwardly to said lower end to form a sealing surface, a metal ring encircling said screw thread and sealing surface and provided with an internal screw thread engaging said first-mentioned thread for connecting the ring to said tubular member, the portion of said ring beside said sealing surface being spaced therefrom and extending downwardly below it and provided with an annular recess encircling and facing said surface, and a resilient sealing member encircling said ring and secured thereto with the portion of the ring beside said sealing surface and below it embedded in the sealing member, the sealing member filling said annular recess and converging downwardly below said ring to a neck portion of reduced diameter for fitting around a drill string, and the inner surface of the sealing member converging from above said annular recess downwardly to said neck portion, the sealing member being compressed between said tapered sealing surface and the encircling portion of said ring to form a seal between said tubular member and ring.

4,345,770

COFFERED SEAL

Reinhold Seeh, Weinheim an der Bergstrasse, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,389

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031870

Int. Cl.³ F16J *15/24, 15/32*

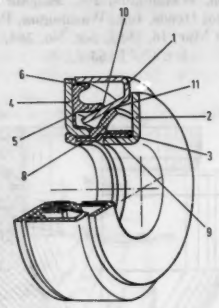
U.S. Cl. 277—48 **6 Claims**

1. A coffered seal comprising:

an outer ring of sheet metal having a substantially U-shaped cross section open toward one axial direction and comprising an outer side and an inner side that extends at an angle of approximately 20° to 50° relative to the axis of the ring;

inner ring means comprising a multi-part structure defining a U-shaped cross section extending axially beyond the outer ring in both axial directions to enclose the outer ring; and

first and second elastomeric sealing rings comprising first and second sealing lips, respectively, within the U-shaped



cross section of the inner ring and bearing against opposite surfaces of the inwardly extending side of the outer ring.

4,345,771

SEALING CUP FOR HYDRAULIC PISTON-CYLINDER DEVICE

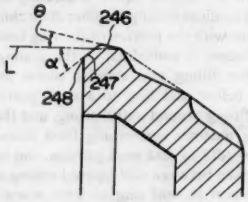
Junzo Hasegawa, Obu; Masatoshi Yamada, Nagoya; Kaoru Nakamura, Anjo, and Eiichi Yasuda, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya; Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, all of, Japan

Continuation of Ser. No. 924,836, Jul. 14, 1978, abandoned. This application Dec. 5, 1980, Ser. No. 213,454

Claims priority, application Japan, Jul. 15, 1977, 52-85385

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—205 **8 Claims**



1. A sealing cup for sealing space between cooperating piston and cylinder walls of a hydraulic piston-cylinder device, said sealing cup comprising:

an annular body of resilient material including an annular base having an axis adapted to be substantially coincident with the axis of said cylinder when installed;

an annular inner sealing lip extending in a first axial direction from said annular base and having an edge remote from said annular base and an inner sealing surface adapted to be engaged with a wall to be sealed; and

an annular outer sealing lip extending in said first axial direction from said annular base so as to encircle said inner sealing lip in spaced relationship therewith and having an edge remote from said annular base and an outer sealing surface adapted to be engaged with a wall surface to be sealed;

at least one of said inner and outer sealing surfaces adapted to be slidably movable with respect to one of said piston and cylinder walls to be sealed, said slidably movable sealing surface consisting of first, second and third annular surfaces having substantially straight line axial profiles, said first annular surface extending from said annular base in said first axial direction and extending at an acute angle to said axis radially outwardly when said corresponding wall is said cylinder wall and radially inwardly when said corresponding wall is said piston wall, said second annular surface connected to and extending from said first annular surface in said first axial direction and extending at an angle to said axis less than said acute angle radially inwardly when said corresponding wall is said cylinder wall and radially outwardly when said corresponding wall is said piston wall, and said third annular surface connected to and extending from said second annular surface in said first axial direction at an angle to said axis greater than said acute angle and extending radially outwardly when said corresponding wall is said cylinder wall and radially inwardly when said corresponding wall is said piston wall, said second and third annular surfaces intersecting at an obtuse angle and defining an annulr groove in said slidably movable sealing surface, the edge of said slidably movable sealing surface and the intersection of said first and second annular surfaces being adapted to exert greater sealing pressure than the vertex of said annular groove when said slidably movable sealing surface is mounted for sealing engagement with said corresponding wall for retaining lubricating oil in said annular groove during axial movement of said slidably movable sealing surface.

4,345,772

CONSTANT STRAIN BOOT SEAL

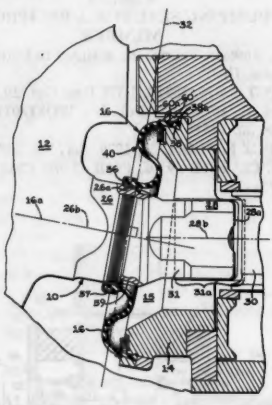
Albert L. Woody; Lawrence E. Fox, both of Peoria, and Harold L. Reinsma, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00118, § 371 Date Jan. 26, 1981, § 102(e) Date Jan. 26, 1981

PCT Filed Jan. 26, 1981, Ser. No. 273,892

Int. Cl.³ F16J *15/52*

U.S. Cl. 277—212 FB **8 Claims**



1. A seal apparatus (**16**) for sealing between a first (**12**) and a second (**14**) relatively displaceable member, said seal apparatus (**16**) comprising:

an annular, rigid inner terminating portion (**36**), an annular, rigid outer terminating portion (**38**), an annular flexible portion (**40**) having an inner margin (**46**), an outer margin (**48**), a longitudinal axis (**16*a***), and a plurality of concentrically arranged, interconnected convolutions (**42,44**), the thickness of said convolutions (**42,44**) perpendicular to a convoluted centersurface (**16*b***) therethrough decreases from said inner margin (**46**) to said outer margin (**48**) in proportion to a radial separation distance (H) between the centersurface (**16*b***) at said inner margin (**46**) and the centersurface (**16*b***) along said convolutions (**42,44**), said inner (**36**) and outer (**38**) terminating portions being respectively joined to said inner

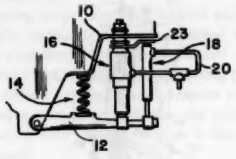
(46) and outer (48) margins and being respectively fixedly attachable to the first (12) and the second (14) members so as to move therewith.

4,345,773

LOAD LEVELING AIR PUMP WITH PRESSURE CLUTCH

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 5, 1979, Ser. No. 91,233
Int. Cl.³ B62D *37/00*
U.S. Cl. 280—6 R 11 Claims



1. An automatic load leveling mechanism for a vehicle having an unsprung mass, a sprung mass supported from the unsprung mass, and a fluid-receiving device for controlling the relative position of said masses, said masses having a variable average separation depending upon the amount of fluid within said fluid-receiving device and upon the weight of the sprung mass, said load leveling mechanism comprising:

a fluid pump for pumping fluid into said fluid-receiving device and powered by the relative movement of said masses in response to motion of said vehicle, said pump comprising a housing connected to one of said masses, a pump piston slidably mounted in said housing and connected to the other of said masses, the feedback means slidably mounted in said housing, said feedback means, said pump piston and said housing cooperating to define a compression chamber therebetween, said pump piston moving relative to said one mass to transfer fluid from said compression chamber to said fluid-receiving device, said feedback means being movable toward said pump piston in response to increasing fluid pressure in the fluid-receiving device; and

fluid control means for permitting fluid to escape from the fluid-receiving device upon at least a predetermined separation of said masses;

said feedback means comprises a pair of relatively movable feedback pistons slidably and sealingly mounted in said housing, one of said feedback pistons comprising an expandible portion for frictional engagement with said housing, said feedback pistons including relatively engageable portions, said engageable portions being engageable with each other to expand said expandible portion into frictional engagement with said housing to limit movement of said feedback means within said housing as said pump piston moves to compress fluid in said compression chamber.

4,345,774

ROLLER SKATE APPARATUS

John C. Poe, Long Beach, and Tony Radecki, Altadena, both of Calif., assignors to R. C. Sports, Inc., Olathe, Kans.

Filed Sep. 11, 1980, Ser. No. 186,166
Int. Cl.³ A63C *17/14*
U.S. Cl. 280—11.2 3 Claims

1. In roller skate apparatus of the general type wherein each skate for use in a right and left pair thereof has

elongate skate plate means,

means adapted for securing said skate plate means to a foot of a user with said skate plate means disposed beneath the foot of the user and longitudinally extending generally horizontally and in the general direction of intended travel of the skate,

a pair of truck means each including axle means carried thereby,

means for mounting said pair of truck means at respectively forward and rearward locations on said skate plate means with the respective axes of said axle means of said pair of truck means disposed beneath said skate plate means, extending generally horizontally and laterally with respect to said skate plate means, and spaced from each other longitudinally of said skate plate means, and

a pair of ground engaging wheel means respectively mounted for rotation upon said axle means of said pair of truck means,

an improved construction for said apparatus including:

there is provided toe stop means,

said structure further includes as an integrally formed part thereof means presenting a pair of laterally offset holes in said skate plate means adjacent the forward end thereof, and

there is provided releasable fastening means for securing said toe stop means to said skate plate means in association with either of said holes,

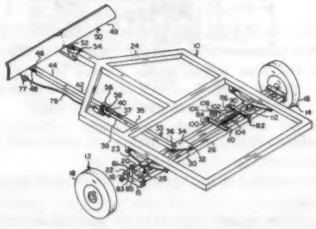
whereby the same toe stop means and fastening means may be employed for skates intended for use on either the right foot or the left foot of a user merely by mounting said toe stop means in association with the appropriately corresponding one of said holes.

4,345,775

AUTOMATIC STEERING SYSTEM FOR A TOWED VEHICLE

Donald V. Merrifield, 6614 Robinhood La., Huntsville, Ala. 35806

Filed Jun. 23, 1980, Ser. No. 162,194
Int. Cl.³ B62D *13/06*
U.S. Cl. 280—443 5 Claims



1. An automatic steering system for steering a two-wheeled towed vehicle when backed, comprising:

a frame and a pair of wheel assemblies positioned on opposite sides of said frame, and said frame being pivotally connectible at a central region of one end, a front end, of said frame to a central point of the rear of a towing vehicle; and

a steering axle assembly extending laterally across said frame and supporting said wheel assemblies, and comprising:

a fixed axle member fixedly attached across said frame,

a hinged member pivotally supported about a vertical axis at each end of said fixed axle, and each hinged member supporting, about a generally horizontal axis, a said wheel assembly,

a steering axle member spaced from and lying generally parallel to said fixed axle member and pivotally attached at each end, about a generally vertical axis, to a said hinged member,

spring bias means for generally biasing said steering axle in a fixed longitudinal position with respect to said fixed axle member, whereby said wheel assemblies are biased to effect straight direction steering of said towed vehicle,

operating lever means pivotally connecting said fixed and steering axle members about generally vertical axes, and whereby rotation of said lever arm effects steering of said wheel assemblies,

steering control means comprising an extensible steering arm extending in a front-to-back direction with respect to said frame and positioned to the side of a general front-to-back axis of said frame and pivotally connected in one end region of said lever means and pivotally interconnectible at an opposite end region of a said towing vehicle, and

control means for selectably locking said steering arm in a selected length position,

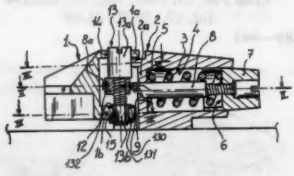
whereby, with said steering arm freely extensible, said lever arm is not operated as said towed vehicle is towed in a forward direction; and, upon the locking of said steering arm in a selected length position, said steering arm operates said lever arm and effects steering coordinate with the direction of movement of a towing vehicle, enabling precise backing of the towed vehicle along a track determined by the steering of the towing vehicle.

4,345,776

SAFETY BINDING FOR SKI

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon & Fils, Annecy, France

Filed Jun. 5, 1980, Ser. No. 156,622
Claims priority, application France, Jun. 6, 1979, 79 14484
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—629 **25 Claims**



1. A safety binding for binding a ski boot onto a ski, said binding comprising:

(a) a jaw adapted to engage and hold one end of said boot on said ski;

(b) a support means adapted to be secured to said ski;

(c) elastic means adapted to bias said jaw towards said support means; and

wherein said binding comprises two lines of support converging above said ski positioned on opposite sides of the longitudinal plane of symmetry of said binding whereby, during release, said jaw is pivotable alternately along each of said lines of support, and wherein said jaw or an intermediate element associated therewith is biased to pivot relative to said support means at an upper point and at two lower points, said three points forming said two lines of support.

4,345,777

BABYS' PUSHCHAIRS, OF TYPE COLLAPSING WIDTHAWAYS AND EASY TO CARRY BY HAND LIKE AN UMBRELLA, PLUS RELATIVE IMPROVED PUSHCHAIR

Giuseppe Perego, Via De Gasperi, 20043 Arcore (Milano), Italy

Filed Feb. 21, 1980, Ser. No. 123,444
Claims priority, application Italy, Oct. 10, 1979, 26390 A/79
Int. Cl.³ B62B *7/08*
U.S. Cl. 280—647 **15 Claims**

1. In a folding perambulator having a pair of side frames each with a side arm, a folding linkage interconnecting the side frames which is foldable to allow the pair of side frames to approach each other in a widthwise collapsed state of the perambulator and unfoldable to allow separation of the side frames in an uncollapsed state of the perambulator, and a foldable seat and seat back connected between the side frames, the improvement comprising:

a rigid cross arm extending between the side arms with the perambulator in its uncollapsed state having one end pivotally connected to one side arm; and

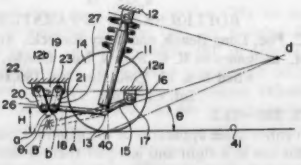
a lever member pivotally connected at one end thereof to an opposite end of said cross arm; said lever member pivotally connected at an opposite end thereof to the side frame carrying the other side arm at a location vertically spaced from the other side arm, so that said rigid cross arm can move from a substantially horizontal position with the perambulator uncollapsed into a substantially oblique position with the perambulator collapsed.

4,345,778

SUSPENSION FOR VEHICLES

Masaaki Minagawa, Kokubunji, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 87,965
Claims priority, application Japan, Oct. 27, 1978, 53-132389
Int. Cl.³ B60G *3/00*
U.S. Cl. 280—701 **10 Claims**



1. In a suspension for vehicles including: a shock absorber having an upper end thereof supported on a first portion of a

vehicle chassis and a lower end thereof connected to a road wheel; an arm supporting said road wheel, said arm being connected at an end thereof to the lower end of said shock absorber and at the other end thereof to a second portion of said vehicle chassis; and a rod supporting said road wheel, said rod being connected at an end thereof to the lower end of said shock absorber and at the other end thereof to a third portion of said vehicle chassis and extending in the longitudinal direction of said vehicle, the improvement comprising:

a pair of links pivotally connected at first ends thereof to longitudinally spaced positions on either one end of said rod and at second ends thereof to longitudinally spaced positions on an element to which said one end of said rod is connected; and

said links having respective longitudinal axes which extend substantially vertically and are inclined relative to each other at a predetermined angle such that said axes of said links intersect at an imaginary supporting point of said rod which is shifted vertically with respect to an actual supporting point of said rod to raise the position of a point around which said shock absorber is angularly movable up and down.

4,345,779

DRIVE MECHANISM FOR A VEHICLE TRAILER LIFTING GEAR

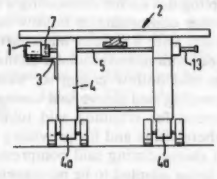
Philip V. Busby, 13 Brunel Ave., Neyland, near Milford Haven, Dyfed, England

Filed Jun. 17, 1980, Ser. No. 160,301

Claims priority, application United Kingdom, Jun. 20, 1979, 7921471

Int. Cl.³ B60S *9/08*

U.S. Cl. 280—766 **11 Claims**



1. For a vehicle trailer lifting gear having two telescopic support legs at the end of the vehicle trailer couplable to a vehicle, operable via a rotatable shaft having first and second ends and gearing to vary the height of the trailer end to permit coupling to or uncoupling from a vehicle, a lifting gear drive mechanism comprising:

an air driven rotary drive unit fixedly attachable to said vehicle trailer and connectible to a source of air under pressure, said drive unit comprising a reversible socket gun drivable by air under pressure and having a drive socket, and

connecting means for drivingly connecting said drive unit to said first end of said rotatable shaft so that with the mechanism in operative association with said vehicle trailer said drive unit can be connected to said source of air under pressure to rotate said shaft one way or the other to extend or retract said support legs, said connecting means including a nut fixedly connectible to said first end of said rotatable shaft for cooperation with said socket.

4,345,780

AUTOMATIC SEATBELT SYSTEM

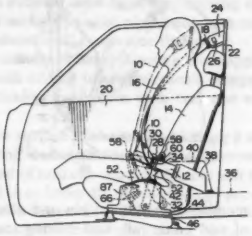
Shigeru Moriya; Hisashi Ogawa, and Mitsuaki Katsono, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1980, Ser. No. 148,037

Claims priority, application Japan, Jul. 4, 1979, 54-93014[U]

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—802 **11 Claims**



1. An automatic seatbelt system wherein an occupant restraining webbing is suspendedly extended at least from a vehicle door to the substantially central portion of a vehicle through a position forwardly of an occupant's seat, and said webbing approaches or recedes from the seat in accordance with the opening or closing the door, comprising:

(a) a guide lever provided at one side of said seat and formed at the forward end thereof with a loop, through which the intermediate portion of the webbing passes, said guide lever being moved by the manual operation forwardly in the vehicle to enlarge a space formed between the seat and the webbing;

(b) a locking device for retaining said guide lever in a condition of being turned forwardly in the vehicle, to thereby prevent said guide lever from returning rearwardly in the vehicle; said locking device comprising a striker provided on said guide lever, a lock lever formed with a projection engageable with said striker in a locked condition, and a release lever formed with a projection engageable with said lock lever to retain said locked condition; and

(c) release means for releasing the operation of said locking device before the vehicle enters the normal running condition, whereby the occupant is brought into a seatelt fastened condition by the returning movement of said guide lever.

4,345,781

WEBBING SLIDER LOCK MECHANISM

Ichiro Suzuki, Nagoya; Masanao Motonami, and Hisashi Ogawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 9, 1980, Ser. No. 148,277

Claims priority, application Japan, May 16, 1979, 54-66186[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **9 Claims**

1. A webbing slider lock mechanism for a passenger restraint system in a vehicle, said mechanism comprising:

a guide rail in the vehicle, said rail having a sliding groove and a driving groove; said rail having a restraining and a releasing end;

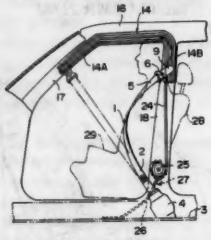
a slider movable within and along said sliding groove and connected to an end of an occupant restraining webbing;

a release arm having a connecting bar, said arm being projectable into said driving groove at the restraining end of said guid rail;

a locking lever below said release arm at said restraining end of said guide rail, said lever being projectable into said

sliding groove to lock said slider, said lever being engagable by said connecting bar of said release arm;

means for biasing said release arm and said locking lever to project respectively and simultaneously into said driving groove and into said sliding groove; and



a driving member movable within and along said driving groove of said guide rail, said driving member having a longitudinal fastening hole, said slider being received in said hole and being of shorter length than said hole to define a space in the direction of travel of said slider, and said driving member including means for pushing said release arm out of said driving groove.

4,345,782

PASSIVE SEATBELT SYSTEM FOR MOTOR VEHICLES

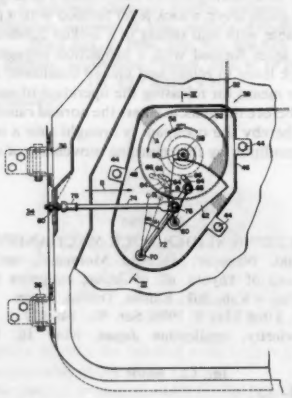
Noritada Yoshitsugu; Masanao Motonami, and Mitsuaki Katsuno, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Jan. 4, 1979, Ser. No. 879

Claims priority, application Japan, Apr. 3, 1978, 53-43571[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—803 **6 Claims**



1. A passive seatbelt system for a vehicle which automatically removes the seatbelt from the passenger or fastens said seatbelt to the passenger when the vehicle doors are opened or closed, comprising:

a take-up pulley which is supported on the vehicle door;

an elongated member wound on said take-up pulley and coupled to said seatbelt for causing movement of the passenger-restraining seatbelt; and

a stroke-amplifying means installed between the take-up pulley and the vehicle body for amplifying the opening and closing strokes of the door and transmitting said opening and closing strokes to said take-up pulley, said stroke-amplifying means comprising:

a pinion which is connected with the take-up pulley,

a sector gear which is supported on the door and which engages with the pinion, and

a speed reducing means for reducing the amount of opening and closing stroke of the door only during the final stage of opening of said door whereby the rotational speed of the take-up pulley during the final stage of opening the door decreases, said speed reducing means comprising a slot formed in the sector gear, said slot having a portion being oriented along a direction of the opening and closing stroke of said door when said door is opened beyond a specified angle;

wherein a force receiving pin which engages with said slot is installed on the end of an arm pivotally supported on the door such that said arm pivots when the door is opened or closed.

4,345,783

PIPE COUPLING DEVICE

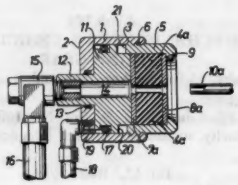
Gunnar M. Bergstrand, Stangholmsbacken 56, 12740 Skärholmen, Sweden

PCT No. PCT/SE78/00049, § 371 Date Jun. 9, 1980, § 102(e) Date May 27, 1980, PCT Pub. No. WO80/00740, PCT Pub. Date Apr. 17, 1980

PCT Filed Oct. 9, 1978, Ser. No. 199,508

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—12 **3 Claims**



1. A pipe coupling device for connecting a conduit to a pipe section, said device comprising: a hollow casing, a resilient sleeve in said casing with a radially inner surface for sealingly engaging said pipe section, and a tubular element axially moveably arranged in said hollow casing for axially compressing and radially expanding said sleeve said casing including abutment means thereon for retaining said tubular element and resilient sleeve therewithin and for providing abutment means for said resilient sleeve during said compression thereof, said tubular element being adapted to be permanently connected to said conduit for the supply of pressurized fluid axially through the interior of the tubular element into said pipe section, said hollow casing comprising a readily detachable unit including a separate casing portion and said sleeve and being easily replaceable by a similar unit having a sleeve with a different radially inner surface adapted to a different pipe section dimension, and said tubular element being a piston with a radially widened portion forming a piston surface to be exposed to an actuation fluid for axially displacing said tubular element during coupling operation.

4,345,784

CONNECTOR ASSEMBLY FOR FLEXIBLE PRODUCTION TUBING

John B. Walling, P.O. Box 16266, Fort Worth, Tex. 76133

Filed May 16, 1980, Ser. No. 150,615

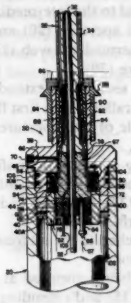
Int. Cl.³ F16L *39/02*

U.S. Cl. 285—39 **12 Claims**

1. A connector assembly for attaching a length of flexible well tubing to a submersible pump of the type including a

housing having a connector box, the flexible well tubing including a tubular outer sidewall covering, a tubular production conduit received within the outer sidewall covering, and a tubular sheath of flexible strands interposed between the outer sidewall covering and the production conduit, said connector assembly comprising, in combination:

a tubular connector housing having an end portion for engaging the pump housing connector box, an axially extending bore for receiving an end portion of the flexible



well tubing, and a counterbore extending axially through said connector housing defining a sealing chamber;

a binding element lodged within the sealing chamber, the binding element having a surface around which the flexible strands can be wound and having an opening through which the production conduit can be extended; and,

an axially movable, annular plug assembly lodged within the sealing chamber for applying a compressive force against the binding element, said plug assembly having an opening through which the production conduit can be extended.

4,345,785

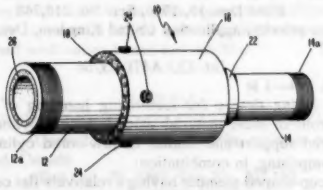
DIELECTRIC PIPE COUPLING FOR USE IN HIGH TEMPERATURE, CORROSIVE ENVIRONMENTS

Randol W. Bradford, Waggaman, La., assignor to Freeport Minerals Company, New York, N.Y.

Continuation of Ser. No. 8,112, Jan. 31, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,293

Int. Cl.³ F16L *59/14*

U.S. Cl. 285—50 **4 Claims**



1. A pipe coupling for electrically isolating two adjacent pipes of dissimilar metals included in a string of pipe to be suspended from its upper end in the hostile environment of a well, said string being subject to high differential fluid pressures and elevated temperatures, said coupling being assembled prior to inclusion in said string in situ, comprising:

an assembly of elements including two generally aligned tubular elements of dissimilar metals respectively electrolytically compatible with a respective one of said two adjacent pipes of said string;

each of the respective outer ends of said tubular elements being threaded for connection with a respective one of said two adjacent pipes;

one of said tubular elements being of uniform outside diameter along its length, terminating at its inner end in a transverse surface normal to its axis and comprising the less expensive of said two dissimilar metals;

the inner end of the other of said tubular elements comprising more expensive of said two dissimilar metals and being provided with and outwardly projecting annular flange having an external axial force-transmitting surface and an inner end surface in axial alignment with and parallel to said first-mentioned transverse surface;

an exterior tubular retainer housing overlapping the inner ends of both of said tubular elements comprising a metal electrolytically compatible with said one of the tubular elements;

the interior surface of the housing having a uniform diameter along its length for a sliding fit over the exterior inner end of said one tubular element and terminating at one end in an inwardly directed flange provided with an axial force-transmitting surface axially spaced from said first-mentioned force-transmitting surface;

the inner annular margin of the flange on the housing being of less diameter than the outer diameter of the other of said tubular elements and defining therewith an annular space;

an annular washer of electrically non-conductive synthetic plastic material resistant to deformation and elevated temperature disposed in contact with and under axial compression between said transverse flat surface and said inner end surface of said tubular elements;

a sleeve of electrically non-conductive synthetic plastic material resistant to deformation and elevated temperature disposed between the housing and the other of the tubular elements, a portion of said sleeve filling said annular space and a medial portion of the sleeve having axially spaced radially directed surfaces disposed in axial force-transmitting abutment between said previously-mentioned force-transmitting surfaces; and another portion of said sleeve extending from said medial portion to said annular washer;

temporary fastening means associated with being provided to prevent axial displacement of the housing relative to said one tubular element during assembly when exteriorly applied axial force to compress said washer has been removed prior to final welding, and;

a permanent weldment joining the housing to said one tubular element to retain said washer in sealing engagement in opposition to "pull out" forces exerted on the coupling when connected in a suspended string of pipes.

4,345,786

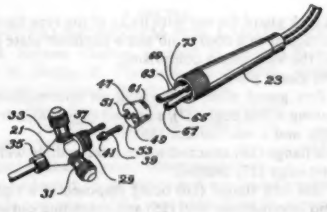
TORCH TUBING CLAMPING APPARATUS

Allen C. Egert, Denton, Tex., assignor to Victor Equipment Co., Denton, Tex.

Filed Apr. 11, 1979, Ser. No. 29,370

Int. Cl.³ F16L *39/02*

U.S. Cl. 285—131 **2 Claims**



1. In tubing clamping apparatus in which a plurality of hoses

carrying respective fluids are to be connected in fluid-tight relationship with a torch having a body that has two respective fuel and oxygen passageways penetrating therethrough, the improvement comprising:

two respective said hose barbs sealingly connected with said body in fluid communication with said respective passageways; said hose barbs being sealingly connected at one end with said torch and having respectively outwardly extending free ends having respective enlarged inverted frusto-conical sections; each said inverted frusto-conical section having a maximum diameter greater than said hose barbs for grippingly receiving the respective hose and having its smaller end extending away from said torch to facilitate insertion of said hose thereover;

two respective said hoses connected respectively with respective said hose barbs by being inserted thereover;

thermoplastic clamping means disposed about said hoses and encompassing said hoses between said clamping means and said hose barbs to hold respective hoses sealingly and frictionally in place; said thermoplastic clamping means comprising a thermoplastic clamp having two apertures penetrating longitudinally therethrough and having a split skirt with radially interiorly protruding shoulders for clamping said hoses; said hoses penetrating longitudinally through respective said apertures in said clamping means; said split skirt being moved radially interiorly to clamp said hoses with its said shoulders against respective said hose barbs; said shoulders comprising respective interiorly protruding segments of a ring in each aperture; said skirt being slit in two places about each hose and longitudinally along each aperture; said skirt being adapted to close said slit sufficiently to clamp said hose with said shoulders; a groove **61** being disposed adjacent the base of said split skirt to facilitate closure for clamping; and

retainer means for retaining said clamping means in clamping relationships with said hoses and said hose barbs; said retainer means comprising a handle that screws onto mating threads onto said body of said torch and compressingly engages said clamping means, forcing said clamping means into clamping engagement with said hoses on respective said hose barbs.

4,345,787

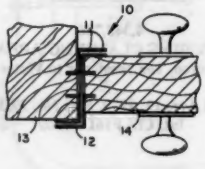
LOCK GUARD

Zdzislaw T. Dabrowski, 3301 Davison Ave., Erie, Pa. 16504

Filed Jun. 9, 1980, Ser. No. 157,899

Int. Cl.³ E05C *21/00*

U.S. Cl. 292—346 **1 Claim**



1. A lock guard for use with locks of the type having a strike plate attached to a door jamb and a latchbolt plate attached to a door, the lock guard comprising,

a first guard plate,

the first guard plate comprising an intermediate web **(15)** having a first edge **(27)**, a second edge **(28)**, a front surface **(35)**, and a rear surface **(15)**,

a first flange **(16)** attached to the intermediate web **(15)** at the first edge **(27)** thereof,

the said first flange **(16)** being disposed at a right angle to said intermediate web **(15)** and extending outwardly from the front and adapted to rest on a door jamb surface thereof,

a second flange **(17)** attached at a second edge **(28)** of the intermediate web **(15)** and adapted to overlie a doorstop,

said second flange **(17)** being disposed at a right angle to said intermediate flange **(15)** and extending rearwardly from the rear surface thereof,

an aperture **(20)** in said intermediate web **(15)** being disposed at approximately the midpoint thereof,

an aperture in said intermediate web **(15)**,

the aperture having a first side and a second side, said aperture being adapted to receive the latchbolt of the door-lock,

a first tab **(18)** attached to the intermediate web **(15)** adjacent a first side of said aperture **(20)** and a second tab **(19)** attached to the intermediate web **(15)** adjacent a second side of said aperture **(20)**,

said first tab and said second tab extending from said web in planes generally parallel to said first flange at said first side and said second side of said aperture **(20)**, respectively,

a second guard plate,

said guard plate being identical in configuration to said first guard plate and comprising an intermediate web **(15)** having a first end **(27)**, a second end **(28)**, a front surface **(35)**, and a rear surface **(26)**,

a first flange **(16)** attached to the intermediate web **(15)** at the first end **(27)** thereof,

said first flange **(16)** being disposed at a right angle to said intermediate web **(15)** and extending outwardly from the front surface thereof,

a second flange **(17)** attached at a second end **(28)** of the intermediate web **(15)**,

said second flange **(17)** being disposed at a right angle to said intermediate flange **(15)** and extending rearwardly from the rear surface thereof,

an aperture **(20)** in said intermediate web **(15)** being disposed at approximately the midpoint thereof,

the aperture having a first side and a second side,

said aperture adapted to permit the latch bolt of the door-lock to pass therethrough a first tab **(18)** attached to the intermediate web **(15)** adjacent a first side of said aperture **(20)** and a second tab **(19)** attached to the intermediate web **(15)** adjacent a second side of said aperture **(20)**,

said first tab and said second tab being generally co-extensive with said first side and said second side of said aperture **(20)**,

said first tab and said second tab extend generally perpendicular to said intermediate web **(15)**.

4,345,788

PAPER ROLL LIFTING DEVICE

Philip T. Newton, 7430 Elliott St., Vancouver, British Columbia, Canada (V5S 2N6)

Filed Dec. 18, 1980, Ser. No. 217,748

Claims priority, application United Kingdom, Dec. 19, 1979, 7943777

Int. Cl.³ A47F *13/08*

U.S. Cl. 294—1 R **10 Claims**

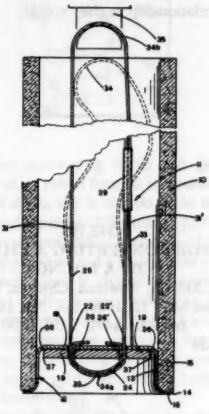
1. A lifting device for facilitating handling of relatively heavy rolls of sheet material wound about a cylindrical hollow-cored support and similar hollow-cored cylindrical objects comprising, in combination:

(a) a cup-shaped member having a relatively flat central base portion, an upstanding cylindrical wall, and an outwardly extending radial flange at the free end of said wall; said wall having an outer diameter at least equal to the inside diameter of the hollow-cored support such that said cup-shaped member is frictionally engaged with the hollow-core support upon force-fit insertion of said cup-shaped member into one end of the hollow-cored support with said radial flange in face-to-face engagement with the radial end wall of the hollow-cored support; said central base portion of said cup-shaped member having a pair of spaced openings extending axially therethrough;

(b) a relatively thick metallic washer positioned within said

cup-shaped member in face-to-face engagement with said flat central base portion; said washer having a pair of spaced openings extending axially therethrough and positioned for registration with the pair of openings formed in said central base portion of said cup-shaped member;

(c) a generally U-shaped saddle-like clip having an arcuate base portion and a pair of upstanding generally parallel legs; said clip being dimensioned so as to permit said legs to be projected upwardly through respective ones of the registered pairs of openings in said washer and said central base portion of said cup-shaped member with the portions of said legs extending beyond said flat central base portion being folded inwardly into face-to-face engagement with said flat central base portion for securing said washer and said flat central base portion together in face-to-face relation; and,



(d) a closed-loop lifting strap formed of resilient springy material characterized by its self-supporting characteristics; said strap having a pair of opposed arcuate loop ends and a pair of generally parallel loop sides and being dimensioned so that said pair of parallel loop sides respectively extend through the pairs of registered openings in said washer and said flat central base portion of said cup-shaped member so as to permit one of said opposed arcuate loop ends of said strap to engage said arcuate base portion of said saddle-like clip in face-to-face relation and the opposed one of said arcuate loop ends of said strap to protect outwardly beyond the opposite end of the hollow-cored support so as to permit selective engagement thereof with cargo hooks and the like.

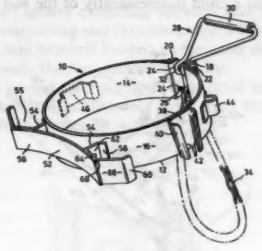
4,345,789

CARRYING DEVICE FOR CYLINDRICAL TANKS

Lawrence C. Garnett, Unionville, Canada, assignor to Enpoco Limited, Canada

Filed Oct. 30, 1980, Ser. No. 202,198
Int. Cl.³ B65D *63/18*
U.S. Cl. 294—31.2 **6 Claims**

1. A detachable carrying device for use with a tank having a torch connected thereto by a flexible hose, said carrying device comprising a band formed to extend around at least a portion of said tank and having an inner surface engageable therewith, connecting means acting between spaced locations on said band and operable to cause relative movement therebetween to move said inner surface into engagement with said tank, a carrying handle connected to said band at one side of said band and a cleat attached to said band at the opposite side of said band and spaced from said spaced locations to provide a storage facility for said hose independent of the operation of said connecting means, said cleat having a pair of support



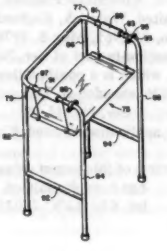
surfaces spaced outwardly from said band to provide a stable position for said tank when supported on said support surfaces.

4,345,790

WALKER WITH DETACHABLE SEAT

Martha D. Coe, 63 E. River Rd., Rumson, N.J. 07760

Filed Jul. 3, 1980, Ser. No. 165,701
Int. Cl.³ A61H *3/04*; A47D *13/04*
U.S. Cl. 297—6 **7 Claims**



1. A walker described having left and right side frames connected by one or more front horizontal members, said side frames each comprising front and rear upright members connected at their upper ends by a top horizontal member, handgrips mounted near the center of each of said top horizontal members, a rectangular seat detachably suspended inside of said walker from said left and right top horizontal members, said seat being suspended at a convenient seating height by means of four S-shaped hooks which engage four holes located near the corners of said seat, in the metal frame there the two hooks attached to the forward or front side of said seat being hooked over said upper horizontal members in front of said handgrips and the other two hooks located to the rear of said handgrips, and a retaining means to prevent said two other hooks from sliding down said two rear upright members.

4,345,791

CHILD RESTRAINT SYSTEM FOR A MOTOR VEHICLE

Thomas J. Bryans, Canton; Richard H. Miller, Wayne, and Arthur W. Single, II, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

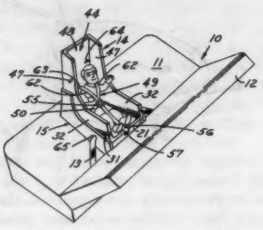
Filed Nov. 3, 1980, Ser. No. 203,007
Int. Cl.³ A47C *1/08*; B60R *21/10*
U.S. Cl. 297—250 **14 Claims**

1. A child restraint system comprising:

a bolster adapted to be supported on a seat cushion of a vehicle seat and a child seat adapted to be supported on the bolster or directly on the seat cushion independently of the bolster,

both the bolster with the child seat supported thereon or the independently supported child seat being held on the seat cushion by a seat belt,

the child seat having a harness system integrated therewith to restrain a child independently of the seat belt,



interengageable means for coupling the child seat to the bolster in an infant carrier mode when the child seat is supported thereon,

and releasable latch means for latching the child seat to the bolster in the infant carrier mode.

4,345,792

SEAT RECLINING MECHANISM

Philip C. Shephard, Coventry, England, assignor to I.H.W. Engineering Limited, Warwick, England

Division of Ser. No. 940,965, May 8, 1978, Pat. No. 4,211,451, which is a continuation-in-part of Ser. No. 781,103, Mar. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 653,659, Jan. 30, 1976, abandoned. This application Jun. 1, 1979, Ser. No. 44,451

Claims priority, application United Kingdom, Feb. 7, 1978, 05235/75

The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.

Int. Cl.³ A47C *1/025*

U.S. Cl. 297—362 **7 Claims**

1. Seat reclining apparatus comprising:

a. first and second internally toothed coaxial ring gears, respectively fixedly connected to bench and back portions of said seat rotatable circularly with respect to one another about a common axis to rotate said seat back with respect to said seat bench, one of said ring gears having more teeth than the other;

b. a drive gear rotatable circularly coaxially with and spaced interiorly of said ring gears; said common axis of said drive and ring gears being stationary;

c. means for rotating said drive gear;

d. at least one planetary idler gear engaging said drive gear and both of said ring gears at a common angular position, each said planetary idler gear rotating about an axis which is parallel to the common axis of said drive and ring gears, each said planetary idler gear axis rotating circularly about said common axis as each said planetary idler gear is rotatably driven by said drive gear and concurrently engages said two ring gears thereby rotating said ring gears coaxially with respect to one another;

e. positioning means, interposed between said drive and ring gears, rotatable with said at least one planetary idler gear around said drive gear about said common axis for maintaining said at least one planetary idler gear in driving contact with said drive gear and said ring gears thereby enabling said ring gears to rotate coaxially with respect to one another; and

f. at least one carrier member movable relative to said shaft and extending between said at least one planetary gear and said positioning means, each said carrier member having a plurality of surfaces facing and adapted for contacting a portion of the periphery of a respective one of said at least one planetary gear and said positioning means to maintain said at least one planetary gear and said positioning means in spaced relationship as they rotate.

4,345,793

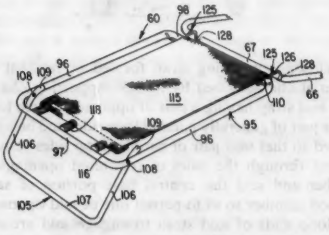
FURNITURE FOR CONVERTING A CHAIR OR SETTEE INTO A LOUNGE

Henry J. Duda, 3357 N. Newland, Chicago, Ill. 60634

Filed May 12, 1980, Ser. No. 149,030

Int. Cl.³ A47C *7/52, 9/00*

U.S. Cl. 297—438 **6 Claims**

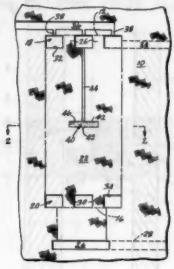


1. Furniture for converting a chair or settee into a lounge, said furniture comprising a generally rectangular frame, a leg assembly pivotally mounted to one end of said rectangular frame movable between a storage position wherein said leg assembly is adjacent said rectangular frame and substantially parallel thereto and a support position wherein said leg assembly extends away from and is supportive of said rectangular frame, a rod positioned parallel and adjacent to the other end of said frame and resiliently mounted thereto, spaced apart hooks each having one end thereof mounted on said rod and the other end thereof extending outwardly and away from the other end of said rectangular frame for removable connection to the associated chair or settee, said hooks each having an arcuate portion thereof passing underneath the associated rectangular frame and over and around said rod and in use pass over the associated chair or settee frame member and extend downwardly therebeyond and fabric connected to said one end of said rectangular frame passing over and around the other end of said frame for connection to said rod, whereby to maintain tension on said rod to maintain said rod in place when said furniture is connected to a chair or settee.

4,345,794
PLACEMENT OF EXPLOSIVE FOR FORMING IN SITU OIL SHALE RETORT

Harry E. McCarthy; Gordon B. French, both of Golden, Colo., and Melvin A. Cook, Salt Lake City, Utah, assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Nov. 10, 1980, Ser. No. 205,872
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 41 Claims



1. A method for recovering liquid and gaseous products from an in situ oil shale retort formed in a subterranean formation containing oil shale, the in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, the method comprising the steps of:

excavating an upper void and a lower void vertically spaced apart from each other in the subterranean formation, at least a portion of the upper void being substantially directly above the lower void, thereby leaving an intervening zone of unfragmented formation between the voids, the intervening zone having an upper horizontal free face adjacent the upper void and a lower horizontal free face adjacent the lower void;

preparing at least one generally cylindrical explosive chamber in the intervening zone between the excavated voids, the axis of such an explosive chamber being substantially perpendicular to the free faces, the length of the axis of such explosive chamber being less than the radius of such explosive chamber;

placing a load of explosive in such explosive chamber;

detonating the load of explosive in such explosive chamber for explosively expanding formation in the intervening zone toward both voids at the same time to produce a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort;

introducing an oxygen-supplying gas to the fragmented mass for sustaining a retorting zone in the fragmented mass and for advancing the retorting zone through the fragmented mass; and

recovering liquid and gaseous products of retorting from a lower portion of the in situ oil shale retort.

4,345,795
WIRE WHEEL WITH DISC BRAKE CLEARANCE

James J. Schardt, Dayton, Ohio, assignor to Dayton Wheel Products Company, Dayton, Ohio

Continuation of Ser. No. 947,033, Sep. 29, 1978, abandoned. This application Jul. 25, 1980, Ser. No. 172,311
Int. Cl.³ B60B *1/04*
U.S. Cl. 301—6 E 2 Claims

1. In a wire wheel particularly for fitting to a vehicle having a brake disc and a brake caliper extending around a portion of the edge of the disc,

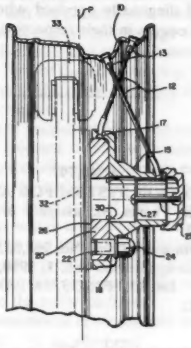
a circular rim having holes therethrough for receiving spoke nipples,

a hubshell having an inner mounting end with a cup-shaped interior and being less in radius than the spacing of the caliper from the wheel center and also having a smaller outer end,

said inner mounting end having radially extending holes adapted to receive spokes

a plurality of spokes extending between said rim and said hubshell supporting said rim concentric with said hubshell and with said hubshell located on the outer side of a plane which bisects the rim circumferentially,

said spokes having enlarged inner ends fitted into said holes in said hubshell and having outer ends terminating inwardly of said holes through said rim,



nipples extending through said holes in said rim and threaded to said outer ends of said spokes;

the improvement comprising

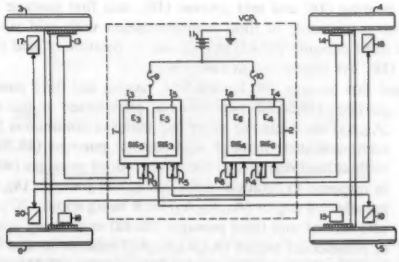
a removable supporting ring rigidly fitted into said cup-shaped inner mounting end of said hubshell covering the inner ends of said spokes and having a mounting face adjacent said plane and on the same side of said plane as said spokes, said ring being removable from said hubshell,

whereby said rim surrounds said brake disc and said caliper is clear of the rotating spokes and hubshell.

4,345,796
ANTI-SKID BRAKE CONTROL SYSTEM FOR CONTROLLING THE TWO PAIRS OF DIAGONALLY OPPOSED WHEELS OF A MOTOR VEHICLE

Erich Reinecke, Burgdorf, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 1, 1980, Ser. No. 174,330
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933336
Int. Cl.³ B60T *8/02*
U.S. Cl. 303—92 8 Claims



1. An anti-skid brake control system for a motor vehicle having at least two pairs of diagonally opposed wheels comprising,

(a) sensing means for producing output signals in accordance with the rotational behavior of each wheel of both pairs of diagonally opposed wheels,

(b) evaluating means for each wheel of both pairs of diagonally opposed wheels for producing control signals in accordance with the output signals,

(c) regulating means for each wheel of both pairs of diagonally opposed wheels for controlling the braking effort in accordance with the control signals, and

(d) switching means for each wheel of both pairs of diagonally opposed wheels for monitoring the evaluating means and for deactivating the regulating means of either of the two pairs of diagonally opposed wheels when a circuit malfunction occurs in their respective evaluating means.

4,345,797

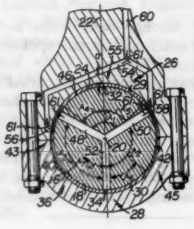
LUBRICATION SYSTEM FOR AN ENGINE

Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 965,532, Nov. 20, 1978, abandoned. This application Feb. 1, 1980, Ser. No. 117,715

Int. Cl.³ F16C *3/14, 9/04*

U.S. Cl. 308—122 **2 Claims**



1. In a lubrication system (36) for an engine (10) having a crankshaft journal (18) having a central axis (20) and a normal axis (22), a connecting rod (14) connected to said journal (18) and a bearing (16) having first and second substantially opposed loading areas (26,28) and being positioned between the journal (18) and connecting rod (14), said first and second loading areas (26,28) being positioned at locations sufficient for receiving principal loads in response to movement of said connecting rod (14), said normal axis (22) intersecting said first and second loading areas (26,28) and said central axis (20), said lubrication system (36) having a first passage (38) in the journal (18) and second and third passages (40,42) disposed between the bearing (16) and said journal (18), said first passage (38) being positionable in fluid communication with said second and third passages (40,42) in response to rotation of said journal (18), the improvement comprising:

said first passage (38) having first, second and third passage portions (48,50,52) positioned at preselected angles (A_1,A_2,A_3) one from the other and being in continuous fluid communication through said passage portions (48,50,52) with at least one of said second and third passages (40,42) in response to rotation of the crankshaft journal (18), said preselected angles (A_1,A_2,A_3) each being about 120°; and said second and third passages (40,42) each being spaced at preselected angles (A_4,A_7,A_5,A_6) relative to said central axis (20) from said points of intersection (32,34) of said normal axis (22) and said first and second loading areas (26,28), said preselected angles (A_4,A_5,A_6,A_7) each having a magnitude greater than 45° and less than about 60°.

4,345,798

REDUCTION IN WEAR OF CONTACTING SURFACES

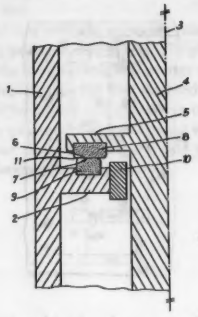
Abel C. Cortes, Le Perray en Yvelines, France, assignor to Compagnie Francaise des Petroles, Paris, France

Continuation of Ser. No. 66,104, Aug. 13, 1979, abandoned. This application Apr. 28, 1981, Ser. No. 258,258

Claims priority, application France, Aug. 11, 1978, 78 23809

Int. Cl.³ F16C *17/04, 33/24*

U.S. Cl. 308—160 **10 Claims**



1. A drilling turbine, comprising; a pair of surfaces adapted to be in sliding contact with one another, each said surface comprising a lapped diamonded surface, one of said surfaces being provided on a ring fixed to a rotor of said drilling turbine, the other said surface being fixed to a ring of a stator of said drilling turbine, said diamonded surface of one of said rings engaging said diamonded surface of the other of said rings.

4,345,799

BEARING ASSEMBLY

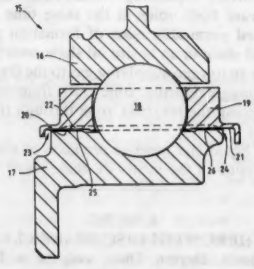
Brian Crofts, Littleover, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 11, 1981, Ser. No. 233,372

Claims priority, application United Kingdom, Apr. 8, 1980, 8011470

Int. Cl.³ F16C *33/66*

U.S. Cl. 308—187 **6 Claims**



1. A rolling element bearing comprising a radially inner bearing race, a radially outer bearing race and a plurality of rolling elements arranged within a bearing cage situated between the two races, the radially innermost cylindrical surface of the cage including at least one oil reservoir consisting of an annular recess, the radially outermost cylindrical surface of the innermost race including at least one radially extending lip arranged adjacent to at least one reservoir, and which lip during rotation of the bearing contacts the oil within the reservoir whereby the cage speed is adapted to be controlled by the inner race.

4,345,800
DOUBLE-ROW RADIALLY SELF-ALIGNING ROLLER BEARING

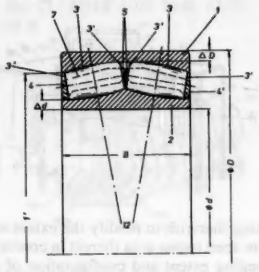
Heinrich Hofmann; Günther Markfelder, both of Schweinfurt, and Hans-Eberhard Bender, Biebertal, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Fed. Rep. of Germany

Filed Feb. 7, 1980, Ser. No. 119,551

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906210

Int. Cl.³ F16C *19/28, 33/48*

U.S. Cl. 308—217 **23 Claims**



1. A double-row, radially self-aligning, roller bearing, comprising:

a radially inner race ring; a radially outer race ring which is radially outward of the radially inner race ring, wherein the race rings define races of the roller bearing;

two annular roller cages, one for each axial side of the roller bearing, and each roller cage being for retaining a respective annular array of rollers at an orientation wherein the rollers generally extend axially of the roller bearing and for guiding the rollers in their rotation;

each cage comprising an annular series of roller pockets, each pocket for retaining a roller therein; the pockets being defined, at the circumferential sides thereof, between a respective pair of circumferentially spaced apart pocket walls of the cage; each cage also being comprised of a pair of annular rings located at axially opposite sides of the pockets, and the pocket walls being attached at the ends thereof to the cage rings; the cage rings of each cage having respective inner and outer diameters selected such that in an axial view of the roller bearing, the projection of one cage ring onto the other cage ring does not intersect the other cage ring;

each cage being a molded unit having a generally axially extending form parting line, which parting line is arranged to generally meet the outer diameter of the axially more outward cage ring of each cage and to generally meet the inner diameter of the axially more inward cage ring of each cage; each roller having a respective central plane, and the angle between the form parting line and the roller central plane being greater than 90°;

two annular arrays of bearing rollers, with each annular array having rollers oriented therein with respective axes that generally extend axially of the bearing; each roller having a roller surface; the pocket walls of the pockets having, at least toward the axial ends of the roller surfaces, guide surface sections which are adapted, along the axial direction of the rollers but not in the circumferential direction of the rollers, to the profile of the respective roller surface, and the guide surface sections having narrow clearance with respect to the roller surfaces.

20. A double-row, radially self-aligning, roller bearing, comprising:

a radially inner race ring; a radially outer race ring which is radially outward of the radially inner race ring, wherein the race rings define races of the roller bearing and the race rings are developed without additional guide elements for the rollers;

two annular roller cages, one for each axial side of the roller bearing, and each roller cage being for retaining a respective annular array of rollers at an orientation wherein the rollers generally extend axially of the roller bearing and for guiding the rollers in their rotation;

each cage comprising an annular series of roller pockets, each pocket for retaining a roller therein; the pockets being defined, at the circumferential sides thereof, between a respective pair of circumferentially spaced apart pocket walls of the cage; each cage also being comprised of a pair of annular rings located at axially opposite sides of the pockets, and the pocket walls being attached at the ends thereof to the cage rings; the cage rings of each cage having respective inner and outer diameters selected such that in an axial view of the roller bearing, the projection of one cage ring onto the other cage ring does not intersect the other cage ring;

to annular arrays of bearing rollers, with each annular array having rollers oriented therein with respective axes that generally extend axially of the bearing; each roller having a roller surface; the pocket walls of the pockets having, at least toward the axial ends of the roller surfaces, guide surface sections which are adapted, along the axial direction of the rollers but not in the circumferential direction of the rollers, to the profile of the respective roller surface, and the guide surface sections having narrow clearance with respect to the roller surfaces;

the bearing has dimensions in accordance with the following approximation:

$$\left(\frac{B}{d/2+\Delta d}\right)^2 \approx 3\left(\frac{D/2-\Delta D}{d/2+\Delta d}\right)^2 - 2\left(\frac{D/2-\Delta D}{d/2+\Delta d}\right) - 1$$

wherein B is the axial width of the bearing, D is the outside diameter of the outer race ring of the bearing, d is inner diameter of the inner race ring of the bearing, ΔD is the minimum wall thickness at the outer race ring and Δd is the minimum wall thickness at the inner race ring.

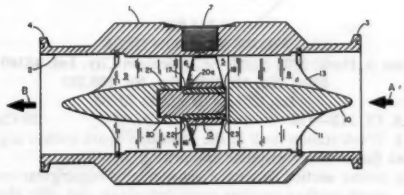
4,345,801
TURBINE METER ROTOR BEARING

Jeptha F. Randolph, Tulsa, and Donald L. Stout, Sand Springs, both of Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 19, 1980, Ser. No. 122,091

Int. Cl.³ F16C *33/20*; G01F *1/10*

U.S. Cl. 308—238 **3 Claims**



1. In a turbine meter having a bored housing and two alligned spider supports within the housing bore, a bearing for a rotor mounted between the two spider supports, including,

a rotor housing with an axial bore and adapted to be mounted between the spider support structures,

a bushing predominantly of polytetrafluoroethylene mounted axially in the rotor bore and terminating in flanges which capture the bushing within the rotor bore,

and a shaft of stainless steel mounted in the downstream of the two spider supports and having a shoulder facing upstream as the shaft extends axially of the bore of the turbine meter body and through the rotor bushing to a predetermined clearance from the face of the upstream spider support,

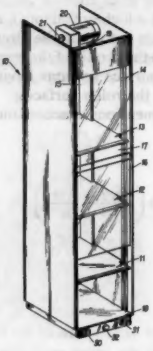
whereby the shaft shoulder forms the normal bearing surface for the downstream flange of the bushing and the upstream spider support face forms a bearing surface for the upstream bushing flange when flow is reversed through the meter.

4,345,802

DISPENSER

Egon Sorensen, Cheyenne, Wyo., assignor to AMF, Inc., White Plains, N.Y.

Filed Sep. 17, 1980, Ser. No. 188,155
Int. Cl.³ A47B *57/00*
U.S. Cl. 312—42 **5 Claims**



1. An overhead article dispenser comprising an elongated vertically positioned cabinet, an article dispensing base in said cabinet, a series of telescopically related boxes in said cabinet, said boxes being open at their top and front sides, means on the top and bottom of immediately adjacent boxes to keep them from separating when expanded with respect to each other, a reversible hoist mechanism on said cabinet to alternately expand and collapse said boxes with respect to each other sequentially one at a time, said boxes when fully expanded being raised off said base whereby articles to be dispensed can be positioned on said base as well as in said boxes, and said boxes when collapsed sequentially bottoming on said base and each other.

4,345,803

WORK STATION DESK

Peter J. Heck, 2801 Maple St., Michigan City, Ind. 46360

Filed Jun. 10, 1980, Ser. No. 158,283
Int. Cl.³ A47B *21/00, 13/08*
U.S. Cl. 312—194 **20 Claims**

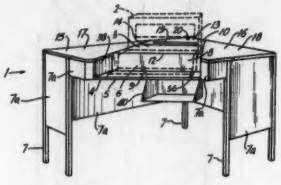
1. Work station desk in the form of a work station angular desk for an office machine comprising

a center section having a substantially rectangular center work surface portion provided along one side thereof constituted as a front side with a substantially straight front access edge of sufficient width relative to the width of an office machine operator to provide an unobstructed work station area thereat and to accommodate an office machine therein,

a pair of opposed diverging side sections angularly disposed to each other and to the center section, each side section having a corresponding substantially triangular side work surface portion adjacent to the center work surface portion,

a selectively shaped and sized office machine accommodating depression recess defined in the center work surface portion and extending forwardly peripherally to the front access edge to provide a lower level open recess area thereat relative to the level of the remainder of the center work surface portion,

compositely complemental cooperating selectively shaped and sized structurally supporting depression recess modifying filler means for removable insertion in the recess and



cooperating therwith to modify the extent and configuration of the open recess area thereat in conformity with the corresponding extent and configuration of an office machine being accommodated in the work station area, and

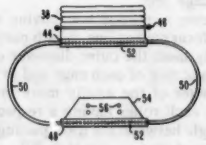
mounting means supporting the center section and side sections in the form of a free standing angular desk correspondingly having a sufficient width at the center work surface portion to provide such unobstructed work station area for an office machine operator situated at the front access edge and vicinally between the adjacent confines of the side work surfaces of the opposed diverging side sections angularly disposed to the center section and to accommodate an office machine in the work station area at such recess.

4,345,804

FLEXIBLE BUSHING CONNECTOR

Thomas J. Lanoue, Muncie, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 1, 1980, Ser. No. 164,872
Int. Cl.³ H01R *11/01, 35/00*
U.S. Cl. 339—9 E **5 Claims**



1. A connector for providing a flexible electrical connection between a winding lead of a winding and a through electrical conductor of a bushing, comprising:

a first conductive member adapted for connection to the through electrical conductor;

a second conductive member;

a plurality of flexible conductors connecting said first conductive member to said second conductive member for mechanically absorbing the motion of said through electrical conductor and for electrically providing a plurality of current paths, said flexible conductors being symmetrically arranged such that a uniform electric field is produced when said flexible conductors are carrying current;

a connecting member carried by said second conductive

member and adapted for connection to said winding lead, said connecting member being located within a plurality of flexible conductors; and

said flexible conductors constituting the only current-carrying conductors connecting said first and second conductive members.

4,345,805

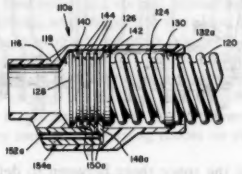
SELF-SEALING VACUUM HOSE SWIVEL FITTING

Richard O. Finley, Redondo Beach, and David A. Stanwood, West Covina, both of Calif., assignors to Plastiflex Company International, Fountain Valley, Calif.

Filed Sep. 17, 1979, Ser. No. 76,285

Int. Cl.³ H01R *3/04;* **F16L** *33/00*

U.S. Cl. 339—16 R **9 Claims**



1. In a vacuum hose formed with an undulated wall, and a fitting securing said hose at least at one of its end portions to one of a wand or tank of a vacuum cleaner, the improvement in swivelably and pneumatically sealing said hose end portion to said fitting comprising:

a sealing surface on the interior of said fitting and swivelably and sealingly engaged under a spring bias with means terminating said hose end portion;

a generally annular flexible lip on said hose terminating means whose sealing engagement with said sealing surface is enhanced by vacuum created in said hose; and

means defining a groove in one of said fitting and said hose end portion and an annular member on the other of said fitting and said hose end portion and rotatably extending within said groove means to form a swivelable coupling therebetween, said swivelable coupling being spaced from said sealing surface and said hose terminating means and cooperating with said sealing surface to resiliently compress a portion of said undulated wall adjacent to said hose terminating means and thereby to form said spring bias and to urge said annular flexible lip into a maintained, positive, pneumatically sealing and swivelable contact with said sealing surface.

4,345,806

WIRE HARNESS RETAINER CLIP

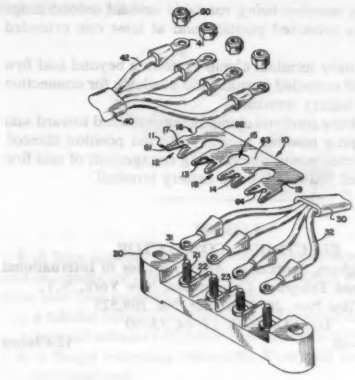
John R. McHenney, Fort Wayne, Ind., assignor to International Harvester Co., Chicago, Ill.

Filed Aug. 15, 1980, Ser. No. 178,316

Int. Cl.³ H01R *31/08*

U.S. Cl. 339—19 **10 Claims**

1. A retainer clip means for securing electrical wire terminal lugs to a plurality of spaced and aligned electrical terminal contact posts of a junction block having a raised block isolating each contact post from the contact post adjacent thereto, the retainer clip means made from a substantially flat and relatively thin strip of an electrical non-conductive flexible material having a generally rectangular configuration, and having at least one terminal post snap-on tab means, said terminal post snap-on tab means being formed by a substantially V-shaped groove having side edges converging laterally, inwardly from a first side edge toward a second, substantially straight side edge of the flat strip, said terminal post snap-on tab means being further formed with a generally circular hole through a portion of the strip intermediate said first and second side edges, said hole intersecting said V-shaped groove at the bottom thereof and generally conforming in shape and cross-sectional area to the outer contour and cross-sectional area of a terminal contact post, the edges of the strip defining said V-shaped groove and said hole partially defining a pair of elongated, laterally extending terminal post snap-on tabs and the intersection of the V-shaped groove and the hole forming a restricted passageway means of a width smaller than the diameter of said hole in a non-flexed state of the tab means along the V-shaped groove for confining a terminal contact post in the hole, the terminal contact post being engageable with the tab



means along said converging side edges of the V-shaped groove leading toward the restricted passageway means thereby flexing the strip portions on opposite sides of the V-shaped groove defining said restricted passageway means and thereby permitting passage of a terminal contact post into the confines of the hole; and flexible shank means operatively interconnecting said terminal post snap-on tab means to a marginal portion of said strip contiguous to said second, substantially straight side edge laterally spaced from said first side edge.

4,345,807

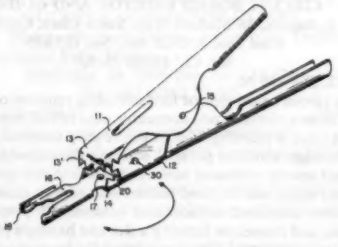
BATTERY CABLE CONNECTOR

Joseph Shekel, New York, and Joseph DeStefano, Carle Place, both of N.Y., assignors to Auto-Line Manufacturing Corp., Copaigue, N.Y.

Continuation-in-part of Ser. No. 125,218, Feb. 27, 1980, abandoned. This application May 27, 1980, Ser. No. 153,156

Int. Cl.³ H01R *11/24, 27/00*

U.S. Cl. 339—31 B **14 Claims**



1. A battery cable connector for alternative attachment to a top terminal of a top terminal battery and a side terminal of a side terminal battery, comprising:

first and second gripping members;

first and second jaws on end portions of said first and second gripping members respectively;

a first hinge coacting with said first and second gripping members and effective to permit manual relative rotation of said first and second jaws between a closed state and an open state;

a support member;

a second hinge pivotally joining a first end of said support member to said first gripping member;

a side battery terminal clamp at a second end of said support member;

said support member being rotatable on said second hinge between a retracted position and at least one extended position;

said side battery terminal clamp extending beyond said first jaw in said extended position and available for connection to a side battery terminal;

said side battery terminal clamp being retracted toward said first gripping member in said retracted position thereof, said retracted position permitting engagement of said first and second jaws with a top battery terminal.

4,345,808

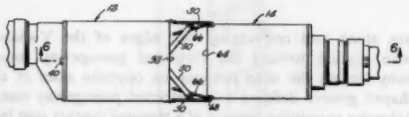
ELECTRICAL CONNECTOR

Francis H. Ingham, Scottsdale, Ariz., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 29, 1980, Ser. No. 208,525

Int. Cl.³ H01R *13/44, 13/60*

U.S. Cl. 339—40 **12 Claims**



1. An electrical connector comprising:

first and second mating connector members each comprising a shell having a forward mating end and a rear;

first closure means on said first connector member shell closing said forward mating end thereof when said connector members are unmated;

second closure means on said second connector member shell closing said forward mating end thereof when said connector members are unmated;

means for selectively shifting said first closure means to an open position; and

said first closure means, when in said open position, automatically opening said second closure means during mating of said first and second connector members.

4,345,809

CIRCUIT BOARD EJECTOR AND GUIDE

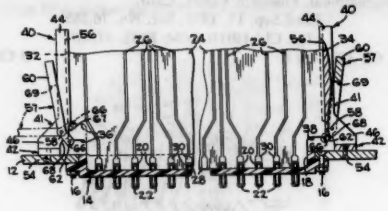
Mary L. Sugden, 58 Michael Way, Santa Clara, Calif. 95051

Filed Jun. 9, 1980, Ser. No. 157,885

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **4 Claims**

1. A circuit board ejector for facilitating removal of a circuit board from a circuit board connector, said circuit board having an end edge, a plurality of conductive strip terminals adjacent the end edge, shoulder portions adjacent the end edge defining first and second abutment surfaces parallel to and spaced from said end edge, and first and second side edges extending from respective abutment surfaces and substantially perpendicular thereto, said connector forming a slot and having a plurality of contacts within said slot for frictionally engaging said strip terminals, said ejector comprising an elongate body and a base rigid with said body, means for affording attachment of said base adjacent on end of said connector, said body defining a channel groove for alignment with said connector slot, said channel groove having a width sufficient to slidably receive said first side edge therein so as to guide said circuit board therein, said channel groove having a depth less than said abutment surface, said body having an offset portion adjacent said base so as to form a clear space between said base and the inner end of said channel groove, a lever having a bifurcated portion defining two furcations that are spaced apart so as to flank said offset portion, said furcations having extremities, means including a pivot extending through said furcations remote from said extremities for mounting said lever to said body for pivoting movement about a pivot axis in said offset portion, a pin mounted on said furcations at said extremities



and spanning the space there between to define an engaging portion remote from said pivot axis and disposed in said clear space in alignment with said channel groove for engagement with said first abutment surface, said lever having a handle portion opposite said engaging portion and accessible from the side of said elongate body opposite said channel groove so that application of force on said handle portion in a direction substantially parallel to said channel groove and toward said base causes said engaging portion to contact said abutment surface within said clear space and move said circuit board along said channel away from said connector slot.

4,345,810

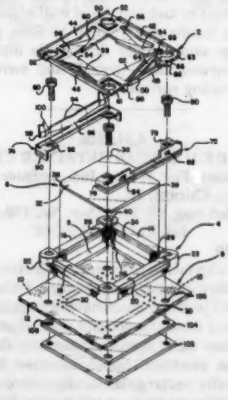
INTEGRATED CIRCUIT CONNECTOR

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 16, 1980, Ser. No. 197,402

Int. Cl.³ H01R *13/639*

U.S. Cl. 339—75 MP **9 Claims**



1. A clamping lid for an electrical connector of the type comprising a rectangular housing having a rectangular well extending into one major surface thereof, said well being dimensioned to receive an IC package of the type comprising a rectangular substrate, an integrated circuit chip mounted on said substrate, and terminal pads on one surface of said substrate, said terminal pads being arranged in rows extending

alongside margins of said one surface, said housing having contact terminals therein for contacting said terminal pads, said lid being intended for assembly to said housing in covering relationship to said IC package and having hold-down spring means engageable with said IC package for clamping said IC package against said contact terminals, said clamping lid comprising:

a flat stamped and formed resilient sheet metal member dimensioned to be mounted on said housing in covering relationship to said IC package, said member having four side rails extending between the four corners of said sheet metal member,

at least two of said side rails, which are opposite, each having a pair of cantilever hold-down springs integral therewith, said cantilever springs extending from two adjacent corners of said member towards each other and having overlapping free ends, said springs extending in opposite oblique directions, with respect to the plane of said member, from one side of said member whereby,

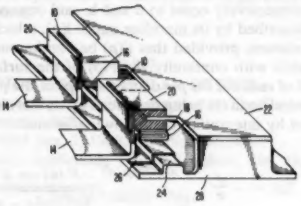
upon placement of said IC package in said well and subsequent placement of said lid on said housing with said one side of said housing opposed to said IC package, said cantilever springs bear against said IC package and are flexed towards the plane of said lid thereby imposing clamping forces on said IC package.

4,345,811

FLAT RIBBON CABLE SHIELD

Lubomir J. Volka, Holbrook, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 27, 1980, Ser. No. 134,522
Int. Cl.[3] H01R *4/66, 23/12, 23/38*
U.S. Cl. 339—143 R **15 Claims**



1. A shielding system for electronic equipment comprising:

an equipment enclosure means;

circuit mounting means mounted within said equipment enclosure means;

connector joining means included on said circuit mounting means;

a cable connector means attached to said connector joining means;

a cable means connected to said cable connector means;

a continuous electrically conductive shielding material covering said cable means;

a protective coating over said continuous electrically conductive shielding material;

a section of said electrically conductive shielding material folded back upon said protective coating;

an electrically conductive clip crimped upon said folded back section of said electrically conductive shielding material;

means attaching said electrically conductive clip to said cable connector means; and

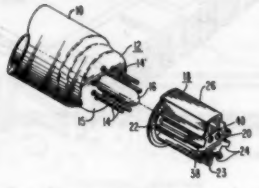
an electrically conductive protruding means on said equipment enclosure means adjacent to said connector joining means, wherein the electrically conductive protruding means contacts said electrically conductive clip upon the joining of said connector means to said connector joining means, thereby providing a cable means shielding system which is operator separable from said equipment enclosure means.

4,345,812

ELECTRON TUBE BASE WITH FLOW CHANNELS THEREIN

Myron H. Wardell, Jr., Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1980, Ser. No. 153,908
Int. Cl.[3] H01R *33/74*
U.S. Cl. 339—144 R **5 Claims**



1. A base member adapted to be disposed over an array of lead-in conductors and an exhaust tubulation of an electron tube, said base member comprising:

a. a tubular housing having an open proximal end for receiving said exhaust tubulation therein and a closed distal end,

b. a flange extending outwardly from said housing at said proximal end,

c. an array of apertures through said flange for receiving said array of conductors therethrough,

d. a recess in said flange communicating with said open end and encompassing at least one of said apertures,

e. an adhesive injection aperture through the wall of said housing at its distal end, and

f. an open longitudinal channel in the internal surface of said tubular housing communicating with said injection aperture and extending from near said distal end of said housing to said recess, wherein said housing has an internal diameter which is only slightly larger than the external diameter of said exhaust tubulation, whereby said tubulation is received in said housing in a relatively close manufacturing tolerance fit with the resulting radial clearance being so small as to impede excessive flow of adhesive material along said tubulation from the distal end of said housing to said recess and whereby as a result thereof said channel provides a preferential flow path along the length of said housing and into said recess for adhesive material injected into said adhesive injection aperture.

4,345,813

KEYABLE CONNECTOR-HEADER ASSEMBLIES FOR MULTIPLE CONDUCTOR CABLES

David A. Hatch, Sherborn, Mass., assignor to Pintek, Inc., Newton Upper Falls, Mass.

Filed Mar. 24, 1980, Ser. No. 133,426
Int. Cl.[3] H01R *23/64*
U.S. Cl. 339—184 M **16 Claims**

1. An electrical connection system comprising:

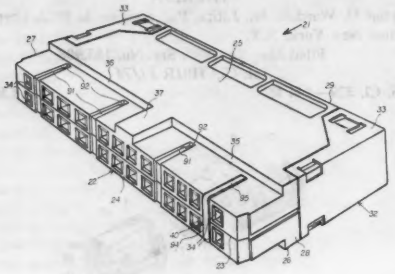
a plug-in connector housing adapted to receive a plurality of electrical signal wires;

a plurality of connector contacts retained by said housing and each shaped and arranged for connection to one of the signal wires;

a header body shaped and arranged to receive said connector housing;

a plurality of header contacts retained by said body and each positioned so as to engage one of said connector contacts upon reception of said connector housing by said header body;

connector keying means selectively disposed at any of a plurality of predetermined positions on said housing; and header keying means selectively disposed at any of a plurality of given positions on said header body and each corresponding to one of said predetermined positions on said



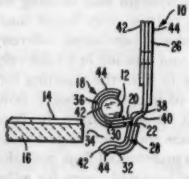
connector housing, and wherein when disposed at any corresponding pair of said predetermined and given positions said connector keying means and said header keying means are shaped and arranged to engage and prevent engagement between said connector contacts and said header contacts.

4,345,814

SOLDER-BEARING LEAD HAVING SOLDER FLOW-CONTROL STOP MEANS

Ernst A. Gutbier, North Andover, and Paul J. Ouellette, Amesbury, both of Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,569
Int. Cl.³ H01R 9/06
U.S. Cl. 339—275 R **10 Claims**



1. A solder-bearing lead, which comprises:

an elongated stem having a solderable portion on at least one surface of the stem;

first and second resilient clamping fingers extending in opposed spaced relationship from the elongated stem to define a gap for the reception of a substrate therebetween, the first resilient clamping finger defining an electrical contact finger having opposite sides, a first surface for engaging a contact pad on the substrate, and a second opposite surface, the second surface forming a continuation of the one surface of the stem and also having a solderable portion;

a solder preform attached to the solderable portion of the second surface of the electrical contact finger; and

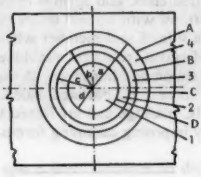
a solder flow-control stop on the second surface of the electrical contact finger closely adjacent the solder preform for precluding flow of molten solder from the solder preform along the second surface of the contact finger to the stem during a soldering operation, and for directing flow of the molten solder essentially directly over at least one of the opposite sides of the contact finger by gravity to the contact pad engaged by the first surface of the contact finger.

4,345,815

PERFECT GEODESIC LENS FOR WAVEGUIDES AND OPTICAL PROCESSOR OF UNIDIMENSIONAL SIGNALS EMPLOYING SAID LENS

Giancarlo Righini, Florence; Stefano Sottini, Vaglia, and Vera Russo, Florence, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Filed Aug. 3, 1979, Ser. No. 63,594
Claims priority, application Italy, Aug. 7, 1978, 9555 A/78
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.18 **6 Claims**



1. Geodesic lens for optical waveguides characterized in that it is formed by four concentric zones (4,3,2,1), of which the two external ones (4,3), having an external radius a and b, are portions of a plane surface, the central zone (1), having a radius d, represents the actual lens, and the remaining zone (2), having an external radius c, is a connecting portion without discontinuities with the contiguous portions (1,3), having the external radius respectively equal to d and b, said connecting zone (2) being described by its meridian curve $l(\rho)$, which can be arbitrarily chosen, provided that $l'(\rho)$ be continuous for $d \leqq \rho \leqq c$ and match with continuity the $l'(\rho)$ of the surface under the parallel of radius d for $\rho = d$ and the $l'(\rho)$ of the plane for $\rho = c$, said central zone (1) being described by its meridian curve $l(\rho)$, obtained by integrating the following formula:

$$l'(\rho) = -\frac{d}{\pi} \int_{\arccos(\rho/d)}^{\square} \frac{F'(\psi)\cos\psi}{\sqrt{d^2\cos^2\psi - \rho^2}}\, d\psi$$

where $F'(\psi)$ is the derivative of the function $F(\psi)$ expressing the longitude travelled by a ray in the surface under the parallel d, said parameters a, b, d having been selected according to the optical characteristics of the lens to be obtained, taking into account the formulae: focal length $f = ab/(a+b)$, aperture $= 2d$, linear magnification $X = b/a$ (or $X = a/b$, according to the position of the image (9) with respect to the source (10)).

4,345,816

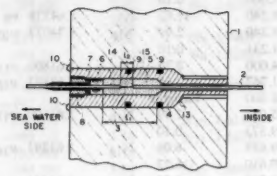
OPTICAL FIBER INTRODUCING EQUIPMENT FOR OPTICAL SUBMERGED REPEATER

Taiichiro Nakai, Fujisawa; Masanori Sato, Machida; Kahei Furusawa, Kamifukuoka; Hitoshi Yamamoto, Kawasaki; Yoshihiko Yamazaki, Kashiwa, and Yoshihiro Ejiri, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 33,232, Apr. 25, 1979, abandoned. This application May 13, 1981, Ser. No. 263,120
Claims priority, application Japan, May 9, 1978, 53-54042
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **9 Claims**

4. In combination, a small-diametered elongated metal cylinder for introducing an optical fiber into the housing of a submarine repeater, the metal cylinder having an axial bore for receiving an optical fiber and an outer diameter dimensioned to fit in a watertight manner into an elongated opening in a hous-

ing for the submarine repeater open to the exterior of the housing, a coated optical fiber extending axially through said axial bore and out thereof at both ends of the metal cylinder, the axial bore having a portion thereof with an enlarged diameter several times larger than the outer diameter of the coated optical fiber and open at an end of the metal cylinder disposed in said elongated opening toward the exterior of the housing of the submarine repeater, the optical fiber having an uncoated portion disposed in said axial bore portion with an enlarged diameter and of less length than an axial length of said axial bore portion, an adhesive having a substantially fixed volume when hardened disposed in said portion of the axial bore filling



the space between the optical fiber and the bore portion of enlarged diameter and covering the uncoated portion of the fiber, the adhesive terminating axially spaced from said end of the cylinder, a chemically stable liquid having excellent wetting ability and low in compressibility in said portion of the axial bore in contact with an end of the adhesive toward said end of the metal cylinder and filling a length of said portion of the axial bore, a packing holding the liquid in said bore portion, a packing gland holding said packing in position and disposed to preclude water entering the bore portion when the metal cylinder is disposed in a submarine repeater which is submerged, and the optical fiber extending through the packing and packing gland.

4,345,817

WIDE ANGLE DISPLAY DEVICE

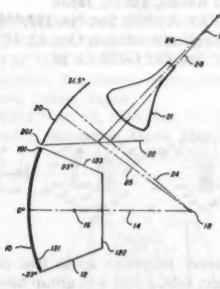
Eric C. E. Gwynn, Hove, England, assignor to The Singer Company, Binghamton, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,903

Claims priority, application United Kingdom, Jan. 29, 1980, 8003002

Int. Cl.³ G02B *27/14*

U.S. Cl. 350—174 **10 Claims**



1. A visual display arrangement for a simulator to develop improved realism in a projected scene as viewed by an observer, comprising:

first and second wide angle display devices in each of which the screen of a CRT is reflected into a concave mirror by a beam splitter through which the observer sees the image of the CRT screen in the mirror,

the concave mirrors of the first and second display devices being positioned contiguously to form a composite visual display scene, and

the CRT axis of at least one display device being so tilted that the CRT screen images as observed in the adjacent concave mirrors are substantially continuous.

4,345,818

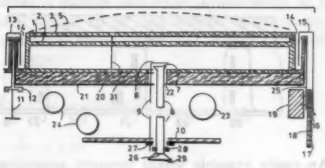
SOLAR DIODES

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 104,305, Dec. 13, 1979, abandoned. This application Jun. 17, 1980, Ser. No. 160,371

Int. Cl.³ G02B *17/00, 27/00*

U.S. Cl. 350—259 **35 Claims**



1. A system for using solar radiation within a building while preventing undesirable energy exchange comprising: fixed relatively short focal length radiation concentrating means of thin cross section of the Fresnel type for concentrating said solar radiation, said concentrating means being of large area and forming part of the weatherproof roof or wall surface of said building or being enclosed beneath a transparent weatherproof roof or wall surface of said building; and small area light guide means for transmitting said concentrated radiation through building structure and/or insulation means of said building; and thereby directing and dispersing said radiation to useful locations within said building, the short focal length of said radiation concentrating means permitting installation of said system in wall or roof region of said building without occupying excessive internal volume of said building.

4,345,819

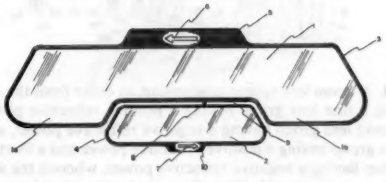
MULTI-ANGULAR PANORAMIC AUTOMOTIVE REAR VIEW MIRROR

Antony-Euclid C. Villa-Real, 2512 Capistrano Ave., Las Vegas, Nev. 89121

Filed Jan. 29, 1980, Ser. No. 116,499

Int. Cl.³ B60R *1/08;* G02B *5/08*

U.S. Cl. 350—304 **23 Claims**



1. A rearview mirror system for a vehicle adapted to be mounted on the vehicle and including at least a pair of adjustably interconnected framed mirrors which can be moved simultaneously or independently relative to each other, including an upper or main mirror adjustably connected to at least one lower or dependent mirror to collectively vary the reflective angles thereof, and wherein the lower section of the main mirror has a structural indentation or cut-out portion to accommodate part of the lower dependent mirror, the combination of said mirrors altogether provide adjustable rearward and

lateral field of vision without substantial obstruction to the forward field of vision.

4,345,820

VISUAL DISPLAY APPARATUS FOR ELECTRICAL SIGNALS RECORDED ON A MAGNETIC MEDIUM

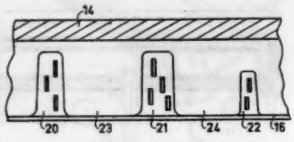
Jacques Chabrolle, Bagnolet, France, assignor to "L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques", Bagnolet, France

Filed May 12, 1980, Ser. No. 148,835

Claims priority, application France, May 10, 1979, 79 11854

Int. Cl.³ G02F *1/01*

U.S. Cl. 350—362 **7 Claims**



1. An easily erasable visual memory apparatus for visual display of signals recorded on a magnetic medium comprising:

a rigid block of non-magnetic transparent material;

a dimple formed in said rigid block and containing a liquid suspension;

a supple membrane closing said dimple;

said liquid suspension comprising magnetic particles susceptible to being displaced by the fields of each magnetic signal of said magnetic medium, said magnetic medium being placed against said supple member to form said visual display and wherein said supple member is adapted to erase said display when a finger is passed over said membrane.

4,345,821

ZOOM LENS

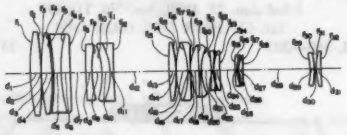
Satoru Tachihara, Wako, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,492

Claims priority, application Japan, Oct. 12, 1979, 54-131526

Int. Cl.³ G02B *15/16*

U.S. Cl. 350—427 **2 Claims**



1. A zoom lens system comprising, in order from the object side, a first lens group having a positive refractive power, a second lens group having a negative refractive power, a third lens group having a positive refractive power and a fourth lens group having a negative refractive power, wherein the second lens group is movable along the optical axis to thereby vary the focal length of the zoom lens system and the third lens group is movable along the optical axis to thereby maintain the image position constant, and the fourth lens group is composed, in order from the object side, of a negative lens, a positive lens, at least one negative lens, and at least one positive lens, the zoom lens system satisfying:

	F = 186.0 ~ 390.0		F_{NO} = 4.50		
	R	D			
1	216.203	11.00	N_1	1.48749 ν_1	70.1
2	−368.288	0.10			
3	210.000	11.55	N_2	1.48749 ν_2	70.1
4	−300.000	1.05			
5	−289.670	8.22	N_3	1.77250 ν_3	49.6
6	159.718	9.50	N_4	1.48749 ν_4	70.1
7	∞	Variable			
8	2539.340	6.50	N_5	1.61800 ν_5	63.4
9	140.152	9.24			
10	−102.000	9.76	N_6	1.80518 ν_6	25.4
11	−62.234	2.89	N_7	1.61800 ν_7	63.4
12	636.576	Variable			
13	400.000	7.09	N_8	1.61800 ν_8	63.4
14	−117.000	0.10			
15	89.240	11.82	N_9	1.64328 ν_9	47.9
16	−89.240	2.99	N_{10}	1.74077 ν_{10}	27.8
17	−2221.231	0.10			
18	54.000	8.25	N_{11}	1.61800 ν_{11}	63.4
19	921.767	2.68	N_{12}	1.68893 ν_{12}	31.1
20	48.800	Variable			
21	−155.000	2.49	N_{13}	1.81600 ν_{13}	46.6
22	89.373	0.10			
23	39.688	6.06	N_{14}	1.61293 ν_{14}	37.0
24	199.610	16.27			
25	189.738	2.22	N_{15}	1.83481 ν_{15}	42.7
26	29.702	1.26			
27	34.227	4.27	N_{16}	1.67270 ν_{16}	32.1
28	328.301	71.17			
29	−46.966	3.40	N_{17}	1.83481 ν_{17}	42.7
30	−85.000	2.38			
31	75.123	4.50	N_{18}	1.61293 ν_{18}	37.0
32	317.405				

Variable Distances

f	186.0	270.0	390.0
d_7	1.85	34.37	67.16
d_{12}	76.02	37.98	1.94
d_{20}	8.39	13.91	17.17

$|f_2| = 98.83 = 0.53\ f_W$

$f_O/f_{123} = 2.19$

$N_L = 1.81600$

$R_L = -155.0 = 1.42\ f_4$

wherein f is the focal length, R is the radius of curvature, D is the thickness on the optical axis and the spacing between lenses, N is the refractive index at the d-line, and ν is the Abbe number of the corresponding lens.

4,345,822

TELEPHOTO ZOOM LENS

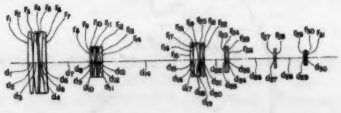
Satoru Tachihara, Wako, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,494

Claims priority, application Japan, Oct. 12, 1979, 54-131527

Int. Cl.³ G02B *15/16*

U.S. Cl. 350—427 **2 Claims**



1. A compact super telephoto zoom lens comprising, in order from the object side, a first lens group having a positive refractive power, a second lens group having a negative refractive power, a third lens group having a positive refractive power and a fourth lens group having a negative refractive power, said second lens group being movable along the optical axis to thereby vary the focal length and said third lens group being movable along the optical axis to thereby maintain the image position constant, said fourth lens group being composed, in order, of a negative lens, a positive lens, at least one positive lens and at least one negative lens, said zoom lens satisfying:

	f = 254.0~980.0		F_{NO} = 10.0		
	R	D			
1	500.000	7.09	N_1	1.49700	ν_1 81.3
2	−646.382	0.22			
3	322.505	8.09	N_2	1.49700	ν_2 81.3
4	−696.315	1.75			
5	−680.500	4.28	N_3	1.74400	ν_3 44.7
6	360.000	5.81	N_4	1.56873	ν_4 63.2
7	1966.422	Variable			
8	605.547	2.65	N_5	1.49700	ν_5 81.3
9	174.750	3.55			
10	−189.000	2.80	N_6	1.61800	ν_6 63.4
11	∞	2.39			
12	−237.849	3.68	N_7	1.74077	ν_7 27.8
13	−99.34	3.00	N_8	1.51821	ν_8 65.0
14	957.523	Variable			
15	816.500	4.91	N_9	1.49700	ν_9 81.3
16	−172.273	0.10			
17	270.359	7.09	N_{10}	1.61800	ν_{10} 63.4
18	−105.738	3.36	N_{11}	1.64769	ν_{11} 33.8
19	−755.188	0.10			
20	144.780	3.68	N_{12}	1.69680	ν_{12} 55.5
21	445.920	2.64	N_{13}	1.74077	ν_{13} 27.8
22	200.000	Variable			
23	−288.350	2.01	N_{14}	1.77250	ν_{14} 49.6
24	143.660	0.10			
25	101.000	4.10	N_{15}	1.59270	ν_{15} 35.3
26	868.000	70.28			
27	814.439	3.57	N_{16}	1.80518	ν_{16} 25.4
28	∞	43.07			
29	79.199	2.01	N_{17}	1.74077	ν_{17} 27.8
30	122.016	2.17	N_{18}	1.83481	ν_{18} 42.7
31	58.575				

Variable Distances

f	254.0	640.0	980.0
d_7	1.83	134.31	232.82
d_{14}	215.34	65.08	0.79
d_{22}	21.06	38.85	4.62

$|f_2| = 148.41 = 0.58\ f_W$
$f_0/f_{123} = 2.59$
$N_L = 1.77250$
$R_L = -288.350 = 1.91\ f_4$

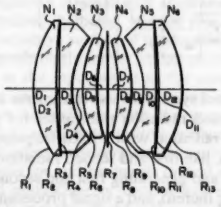
where f is the focal length, R is the radius of curvature, D is the thickness on the optical axis or the spacings between lenses, N is the refractive index at the d-line, and ν is the Abbe number of the respective lens.

4,345,823

REPRODUCTION LENS HAVING A SIX GROUP SIX ELEMENT COMPOSITION A LARGE VIGNETTING FACTOR AND A COMPACT SIZE

Hiroichi Shinohara, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,739
Claims priority, application Japan, May 30, 1979, 54-66147
Int. Cl.³ G02B 9/62
U.S. Cl. 350—464 **1 Claim**



1. A reproduction lens assembly comprising: two groups of three elements for providing a large aperture efficiency and a compact size formed by arranging a lens system symmetrically with respect to a stop, wherein said two groups of three elements include a first pair of convex Meniscus lenses having a concave surface thereof directed toward said stop, said stop being positioned between the lenses of the first pair of Meniscus lenses, a second pair of concave Meniscus lenses having a concave surface thereof directed toward the stop and a third pair of convex meniscus lenses having a concave surface thereof directed toward the stop with a small air gap being formed between the third pair and second pair of Meniscus lenses, wherein r_1 denotes a surface of a stop, r_2, $r_3 \ldots r_7$ denote a radius of curvature of each of said lenses, respectively, d_1 denotes the distance between the stop and each of said lenses of the first pair of lenses, d_2, $d_3 \ldots d_6$ denote the distance between each surface of said lenses, respectively, n_1, n_2, n_3 denote a refractive index of each of said lenses, respectively, f_1, $f_2 \ldots f_7$ denote a focal length up to each surface, respectively, and f denotes a composite focal length, and wherein the following conditions are met:

$$0.00981\,f < d_1 < 0.01962\,f \tag{1}$$

$$1.32 < \frac{f}{f_3} < 1.40 \tag{2}$$

$$-3.1 < \frac{f}{f_5} < -2.7 \tag{3}$$

$$0.01717\,f > d_3 \tag{4}$$

$$-0.1325\,f < r_4 < -0.1227\,f \tag{5}$$

$$0 < n_3 - n_2 < 0.07 \tag{6}$$

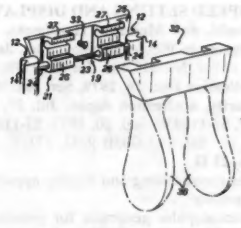
$$0.108\,f > d_1 + d_2 + d_3 + d_4 + d_5 + d_6 \tag{7}$$

4,345,824

EYEGLASS FRAMES OPENABLE AT THE BRIDGE

Jean-Michel Daubignard, Villiers-sur-Marne, France, assignor to Essilor International "Cie Generale d'Optique", Creteil, France

Filed Jun. 24, 1980, Ser. No. 162,636
Claims priority, application France, Jun. 27, 1979, 79 16524
Int. Cl.³ G02C 1/00, 1/08, 5/12
U.S. Cl. 351—98 **7 Claims**



1. In an eyeglass frame a frame front comprising two rims adapted to receive lenses, a pair of substantially parallel pins interconnecting said rims, each of said rims having an inner open end facing each other and defining a slot between said pins, a first of said pins forming a pivot pin permanently pivotally mounting a latching member and releasable latching means operatively arranged between said latching member and a second of said pins.

4,345,825

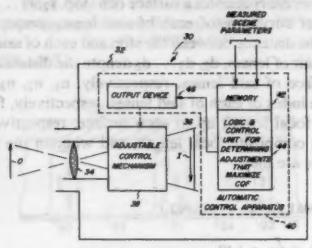
APPARATUS FOR AUTOMATIC CONTROL OF A PHOTOGRAPHIC CAMERA

Lawrence J. Matteson, Rochester; Roger J. Greenwald, Churchville, and Carl N. Schauffele, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,260

Int. Cl.³ G03B 7/091

U.S. Cl. 354—23 D **11 Claims**



1. In a photographic camera having a mechanism for adjusting one or more of the following camera functions: aperture size, shutter speed, flash output, and lens extension, an automatic camera control apparatus responsive to measured scene parameters including at least subject brightness and subject distance, for adjusting the mechanism, said control apparatus comprising:

logic means including a memory unit, said memory unit containing signals representing a mapping function defining the adjustment of said mechanism for particular combinations of values of scene parameters said adjustment being determined by maximizing an objective figure of merit relating measurable photographic parameters to subjectively perceived picture quality;

means for measuring the values of such scene parameters for a particular scene to be photographed;

means controlled by said measuring means for supplying said logic means with signals representing the measured values;

said logic means being responsive to said signals representing the measured values for producing signals representing corresponding values for the adjustment of the mechanism determined by said mapping function; and

control means responsive to the signals produced by said logic means for adjusting the mechanism to the produced values.

4,345,826

SHUTTER SPEED SETTING AND DISPLAY APPARATUS

Akira Takahashi, and Masanori Hashimoto, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Japan

Continuation of Ser. No. 928,682, Jul. 27, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,404

Claims priority, application Japan, Jul. 27, 1977, 52-90169; Sep. 20, 1977, 52-113030; Sep. 20, 1977, 52-113031

Int. Cl.³ G03B 9/62, 17/18

U.S. Cl. 354—23 D **6 Claims**

1. A shutter speed setting and display apparatus for use in a camera, comprising:

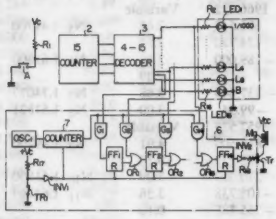
(a) an electrical pulse generator for generating pulses at a rate slow enough to manually select any number of said pulses within an operating range of numbers of said pulses;

(b) an up-down counter for counting said pulses to a selected count value within said range, said up-down counter having an up-count input terminal and a down-count input terminal;

(c) a first AND gate having one input connected to said pulse generator and an output connected to said up-count input terminal of said counter;

(d) a second AND gate having one input connected to said pulse generator and an output connected to said down-count input terminal of said counter;

(e) first and second manually controlled push-button switches connected to another input of said first and second AND gates respectively for allowing pulses from said pulse generator to be transmitted to said counter as long as one of said manually controlled push button switches is depressed to establish a count value in said counter;



(f) decoding means connected to said counter to transform the selected count value of said pulses to a speed-controlling signal;

(g) shutter speed operating means connected to said decoding means to be controlled by said speed-controlling signal; and

(h) visible display means connected to said decoding means to be controlled thereby to indicate visually and in sequence the speed value corresponding to said selected count value.

4,345,827

DISTANCE-MEASURING SYSTEM WITH IN-RANGE SIGNALLING FOR USE WITH CAMERAS, ALARMS, AND THE LIKE

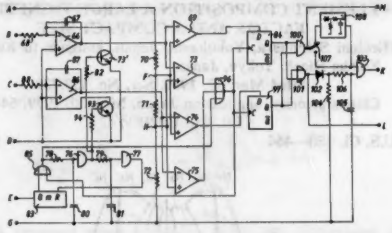
Otto Stemme, Munich; Peter Lermann, Naring, and Istvan Cocron, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,600

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939139

Int. Cl.³ G03B 7/08

U.S. Cl. 354—25 **16 Claims**



1. In a control system for use in cameras and the like which utilizes a clocked radiation transmitter for periodically emitting pulses of radiation with a fixed frequency, amplitude and pulse duration, like first and second radiation receivers receiving the pulses and generating first and second received signals corresponding thereto, and a signal processing network including two channels for processing the first and second received signals so as to reduce background radiation and noise, an improvement for converting the first and second received signals to digital signals and indicating when an object is lo-

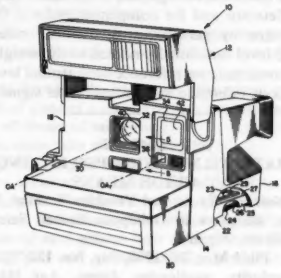
cated within a range of focus comprising: integrating means connected to the signal processing network and responding to the first and second received signals so as to produce first and second analog signals which are a time integrated transformation of the received signals; threshold means connected to said integrating means and having threshold values which are large as compared to pulse amplitude and a noise component, the threshold means operating in a manner that digital input signals are produced which are characteristic of said analog signals and being logically high when the analog signals exceed the threshold values and being logically low otherwise; storage means cooperating with said threshold means by storing said digital input signals and releasing the same in response to a pulse at the end of each measuring cycle of said transmitter; control means including logical AND or OR gating members having inputs connected to said storage means so as to produce an in-range signal only upon the occurrence of a logically high digital input signal, two RC timing circuits, an additional AND gate having an input selectively connectable to the output of said AND gating member either directly or via one of said RC timing circuits, and another input connected via the other RC timing circuit to the output of said OR gating member; and a first output terminal connected to the output of said OR gating member, a second output terminal connected to the output of said AND gating member, and a third output terminal connected to the output of said additional AND gate.

4,345,828

LIGHT DETECTING APPARATUS FOR PHOTOGRAPHIC CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1980, Ser. No. 219,930
Int. Cl.³ G03B *7/08, 9/38, 9/40*
U.S. Cl. 354—27 **5 Claims**



1. Photographic scene light detecting apparatus for use with a camera of the type which includes means for facilitating the positioning of film in an exposure plane, a light path for transmitting scene light to the exposure plane, and an electronic control system for receiving an input signal and controlling the firing of an electronic flash at a predetermined time after the initiation of an exposure interval, said apparatus comprising:

light detecting means, including at least one photodetector having a photosensitive surface of predetermined size with a central axis therethrough, for providing an electrical output signal for use as the input signal to the camera electronic control system, said output signal having a characteristic which varies in accordance with the amount of radiant power incident to said photosensitive surface;

optical means, including a converging lens stationed forwardly of said photodetector and having its optical axis offset with respect to said photodetector central axis and an oblique conical shaped tunnel positioned forwardly of said converging lens, converging toward said lens, and having an axis therethrough offset below said photodetector central axis, said converging lens structured and arranged to direct radiant energy from a scene toward said photodetector photosensitive surface whereby said photodetector operates to provide said output signal and said tunnel structured and arranged to limit the useful angular field of said converging lens;

blade apparatus; and

means for mounting said blade apparatus for displacement between a first arrangement in which said blade apparatus is simultaneously in light blocking relation to both the camera light path and said photodetector thereby precluding scene light from being transmitted along the camera light path and from impinging on said photodetector photosensitive surface and a second arrangement in which said blade apparatus is simultaneously in light unblocking relation to both the camera light path and at least a portion of said photodetector photosensitive surface, said blade apparatus being structured to define a primary varying aperture aligned with the camera light path which aperture changes from an initial value to a final value during displacement of said blade apparatus from its first to second arrangement and further structured to selectively uncover different portions of said photodetector photosensitive surface during displacement of said blade apparatus from its first to second arrangement,

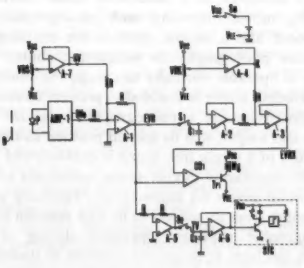
said optical means, said photodetector, and said blade apparatus being structured to in combination operate so that, during displacement of said blade apparatus from its first to its second arrangement, said light detecting apparatus views the scene through different angular fields for different positions of said blade apparatus to facilitate exposure control by preferentially receiving radiant energy from different regions of a scene corresponding to times before and after the time at which the electronic flash is fired, one of said angular fields, corresponding to the time prior to the firing of the electronic flash, being aimed below the horizontal to preferentially expose subject matter in the lower regions of the scene and another of said angular fields, corresponding to the time after the firing of the electronic flash, being aimed equally above and below the horizontal to equally expose subject matter in the upper and lower regions of a scene.

4,345,829

PROGRAM-CONTROLLED CAMERA

Kenichi Shinbori, Kawasaki; Shinji Sakai; Nobuhiko Shinoda, both of Tokyo; Tadashi Ito, Yokohama, and Hiroyasu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1980, Ser. No. 128,400
Claims priority, application Japan, Mar. 24, 1979, 54-34921
Int. Cl.³ G03B *7/087*
U.S. Cl. 354—37 **4 Claims**



1. A camera comprising:

(a) a light measuring circuit for producing an output corresponding to a value Bvo representing the brightness value measured at the fully open aperture value of an interchangeable lens;

(b) information setting means for entering data corresponding to a value Sv representing the speed of film to be used;

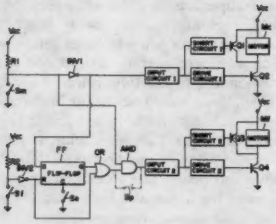
(c) a program constant signal forming circuit for producing a signal representative of a selected program constant K, said signal forming circuit being arranged so that the value of the program constant K can be selected irrespective of the aperture value; and

(d) a control circuit for controlling the aperture and shutter time in accordance with the output of said light measuring circuit, the data from said information setting means and the value of the signal from the program constant signal forming circuit based on the Apex equation: Bvo+SV-=Avs+Tv and the formula: Tv=αAvs+K in which α= is a constant and Avs in the stop-numbered diaphragm value.

4,345,830
MOTOR DRIVEN TYPE CAMERA

Kazuhisa Aratame, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed Feb. 24, 1981, Ser. No. 237,686
Claims priority, application Japan, Mar. 4, 1980, 55-26190
Int. Cl.³ G03B *1/12*
U.S. Cl. 354—173 **6 Claims**



1. In a motor driven camera which includes a motor for charging a shutter of the camera, a motor for winding film in the camera, and control circuit means for driving the shutter charging motor and the film winding motor in response to external signals input to the control circuit means, the improvement comprising:

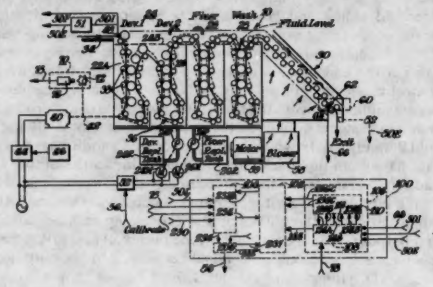
a selecting switch connected to the control circuit means and selectively movable between a first position in which the camera operates in a normal photographic mode such that the shutter is charged by the charging motor and the film is advanced to a successive frame thereof by the winding motor following each photographic exposure operation, and a second position for enabling multiple exposure photography in which the shutter charging motor is operable normally to charge the shutter but the film winding motor is disabled to prevent advancement of the film following a photographic exposure operation while said switch is in its second position so that multiple exposure of a single film frame is enabled; and

automatic restoration circuit means connected to said control circuit means for automatically returning said selecting switch from its second to its first position following a photographic exposure operation during which said switch has been in its second position to disable the film winding motor and thereby enable multiple exposure photography, whereby inadvertent further multiple exposure of a film frame immediately following a desired multiple exposure thereof and due to a user's forgetting to return said switch from its second to its first position is positively prevented by said automatic restoration circuit.

4,345,831
AUTOMATIC REFERENCE BACKGROUND MONITORING NETWORK FOR A FILM PROCESSOR

Robert W. Kachelries, West Goshen, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1980, Ser. No. 136,806
Int. Cl.³ G03D *13/00*
U.S. Cl. 354—298 **14 Claims**



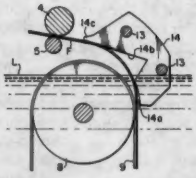
1. In a film processor including a scanner arrangement having a light source and a photodetector responsive to the intensity of the light source for generating a reference background level signal representative of the intensity of the output of the scanner arrangement when no film is interposed between the photodetector and the source, the reference background level being useful as a standard against which the transmissivity of processed film is determined, wherein the improvement comprises:

a reference background level monitoring network for tracking the reference background level signal output from the photodetector and for compensating for a fluctuation in the source by generating an adjusted reference background level functionally related to the weighted average of the instantaneous reference background level signal and a previous reference background level signal.

4,345,832
AUTOMATIC FILM DEVELOPER HAVING A FILM GUIDE MEANS

Norimasa Nomura, Kyoto, and Yasuhito Yoshimi, Mukou, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 24, 1980, Ser. No. 132,782
Claims priority, application Japan, Apr. 11, 1979, 54-48085[U]
Int. Cl.³ G03D *3/12*
U.S. Cl. 354—320 **2 Claims**



1. An automatic film developer having a film guide means, comprising:

a liquid tank in which a developing liquid is contained;

a belt, movably mounted in the tank, which conveys a film fed in the tank in the developing liquid while the film is developed; and

a film guide means having a contact surface in its one side,

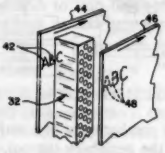
part of which is immersed in the liquid, and which includes a plurality of recesses over the majority of the portion of the length of said surface which is out of the liquid, whereby film which is transferred along said contact surface may be separated from said contact surface in the recess portions.

4,345,833

LENS ARRAY

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 23, 1981, Ser. No. 237,327
Int. Cl.³ G03B *27/00*; C03C *25/00*
U.S. Cl. 355—1 **6 Claims**



1. A lens array comprising:
an arrangement of juxtapositioned cylindrical sections of glass each having a radial gradation of refractive index ranging from a maximum at its axis to an outermost minimum and a length defining object and image planes according to imaging rules of self-focussing lenses;
a matrix of supporting glass surrounding each of said sections, said matrix having a refractive index approximating said minimum of said graded index sections and further having light-absorbing properties for absorption of light straying from said sections.

5. A method of making a lens array comprising the steps of:
providing a perform of rod and cladding ion exchangeable glasses;
heating and drawing the preform to the extent of rendering said rod of glass of a diametral size corresponding to that desired of lenses of said array;
cutting the draw into multiple lengths;
assembling said lengths in an orderly array;
heating the array to a temperature sufficient to render said cladding glass homogeneous as a matrix about said rod glasses and, at the same time, effect interdiffusion of ions from one of said glasses into the other to the extent of rendering said rod glasses radially graded in refractive index; and
at one stage of said method, cutting said rod glasses to desirable image forming lengths and optically polishing opposite faces thereof.

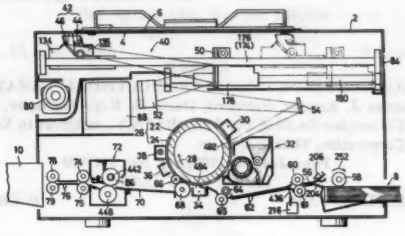
4,345,834

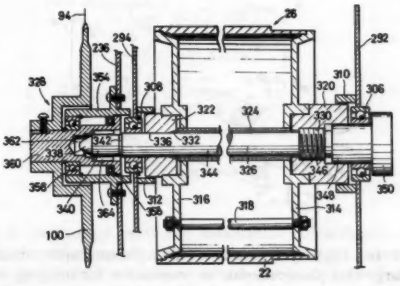
TRANSFER TYPE ELECTROSTATIC COPYING APPARATUS

Hiroshi Kimura, Neyagawa; Masahiko Hisajima, Osaka, and Yutaka Shigemura, Takarazuka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Oct. 17, 1979, Ser. No. 85,518
Claims priority, application Japan, Nov. 2, 1978, 53-135331; Dec. 31, 1978, 53-182460[U]; Dec. 31, 1978, 53-182461[U]; Dec. 31, 1978, 53-182462[U]; Jul. 3, 1979, 54-84540; Jul. 3, 1979, 54-92103[U]
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **11 Claims**

1. In a transfer type electrostatic copying apparatus of the type comprising a cylindrical drum and a photosensitive layer provided on a peripheral surface of said drum, means for rotating said drum, a support for an original document to be copied, an optical system for illuminating the original document and for exposing a light image thereof onto said photosensitive layer, and one of said support and said optical system including a movable portion movable in a first direction from a home first position to a second position and movable in a second direction opposite to said first direction from said second position to said home first position, the improvement comprising:
an endless member entrained around first and second wheels to have first and second parallel linear runs, one of said wheels being rotated such that said endless member moves in an endless path around said wheels and along said linear runs;
said endless member having fixed thereto a first engaging member movable with said endless member in said endless path;
a second engaging member fixed to said movable portion;
connecting means for permanently connecting said first engaging member to said second engaging member in a manner to prevent relative movement therebetween in directions parallel to said linear runs and to allow relative movement therebetween in directions transverse to said





linear runs by a distance at least equal to the spacing between said linear runs, and for thereby causing said endless member and said engaging members to move said movable portion in said first direction when said first engaging member is in said first linear run and to move said movable portion is said second direction when said first engaging member is in said second linear run;
said first engaging member being located at a position at the outer periphery of said first wheel and furthest spaced from said second wheel when said movable portion is at said home first position thereof;
cleaning means, positioned adjacent said photosensitive layer, for cleaning the outer surface of said photosensitive layer when said movable portion moves in said first direction from said home first position;
means for initiating and completing said exposing of said light image onto said photosensitive layer when said movable portion moves in said second direction back to said home first position;
means for synchronizing the speed of said movable portion

in said second direction to be equal to the speed of said outer surface of said photosensitive layer;

a pair of bearings having a common axis and mounted on side walls on opposite sides of said photosensitive drum in the direction of the axis thereof, the inner diameter of one said bearing being larger than that of the other said bearing;

a rotary shaft having a tip portion formed into an approximate conical shape, said shaft extending through said drum and being supported by said bearings; and

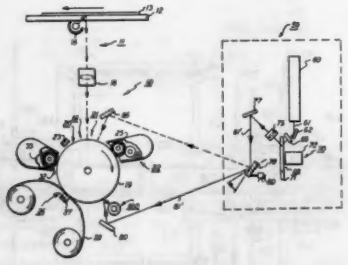
coupling means for transmitting driving force to said rotary shaft and positioned on the side of said photosensitive drum opposite the side thereof into which said shaft is inserted, said drum having extending outwardly from opposite sides thereof bosses fitting into open upper ends of holder members rigidly fixed to said side walls.

4,345,835

MULTIPLE FUNCTION REPRODUCTION APPARATUS

Charles J. Kramer, Pittsford; David B. Kay, Rochester, and Christopher Snelling, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1980, Ser. No. 111,520
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **16 Claims**



1. In a copying apparatus having a photoreceptor, means to charge said photoreceptor in preparation for imaging, exposure means for exposing said charged photoreceptor to produce latent electrostatic images, developing means for developing the images, and transfer means for transferring said developed images to copy substrate material, the improvement comprising:

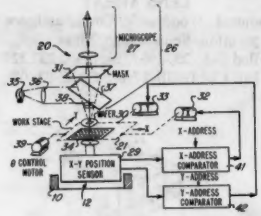
combined image write/read means for scanning said photoreceptor, said image write/read means being operable in a first write mode to expose said photoreceptor in accordance with image signals input thereto to produce said latent electrostatic images on said photoreceptor and in a second read mode to expose images previously developed on said photoreceptor to produce image signals representative of said previously developed images, said developing means in said first write mode applying developing material to said photoreceptor to render said latent electrostatic images visible after said latent electrostatic images are produced by said image write/read means and in said second read mode applying developing material to said photoreceptor to render latent electrostatic images on said photoreceptor visible before said latent electrostatic images are exposed by said image write/read means.

4,345,836

TWO-STAGE WAFER PREALIGNMENT SYSTEM FOR AN OPTICAL ALIGNMENT AND EXPOSURE MACHINE

Edward H. Phillips, Mountain View, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Filed Oct. 22, 1979, Ser. No. 87,220
Int. Cl.³ G03B *27/42*
U.S. Cl. 355—53 **22 Claims**



1. In a method for prealignment of a wafer, having an alignment flat formed at the periphery thereof, in an optical alignment and exposure machine, the steps of:

receiving the wafer at a prealignment station;

turning the wafer about an axis generally perpendicular to a plane of one of its major faces to bring the alignment flat of the wafer into alignment with a first reference operatively associated with the prealignment station to derive a first stage of prealignment of the wafer;

transferring the first-stage prealigned wafer directly to a rotatable alignment and exposure chuck while maintaining the first stage of prealignment of the wafer; and

aligning the alignment flat of the wafer with a second reference operatively associated with said chuck to derive a second stage of more precise prealignment of the wafer.

17. Alignment apparatus for sequentially aligning workpieces with respect to a masking element prior to exposing a photosensitive film on each aligned workpiece in accordance with the masking element, said alignment apparatus comprising:

first prealignment means for receiving a workpiece and prealigning the workpiece with respect to a first reference;

chuck means for rotating a prealigned workpiece to facilitate optical alignment of the prealigned workpiece with respect to the masking element;

transfer means for transferring the prealigned workpiece from the first prealignment means onto the chuck means; and

second prealignment means coupled to the chuck means for rotation therewith and for further prealigning the transferred prealigned workpiece with respect to a second reference while the transferred prealigned workpiece is on the chuck means and while the chuck means is at the angular position of optical alignment of a preceding workpiece.

4,345,837

ENHANCED FLUORESCENT EMISSION

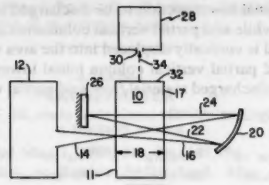
Eli A. Kallet, New York, N.Y., assignor to Farrand Optical Co., Inc., Valhalla, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,846
Int. Cl.³ G01N *21/64*
U.S. Cl. 356—317 **4 Claims**

1. In a method of providing an increased path length of light through a sample wherein a light source transmits an exciting beam of light through said sample in a forward direction, the improvement comprising the steps of:

reflecting said exciting beam from a first reflector in a backward direction along a known path through said sample, thereby forming a first reflected beam; and

imaging said first reflected beam upon the surface of a second reflector to cause a second reflected beam to be reflected in said forward direction along said known path through said sample to said first reflector and to be reflected directly back to said light source.

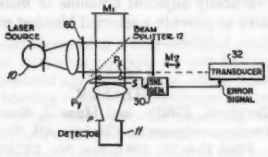


4,345,838

APPARATUS FOR SPECTROMETER ALIGNMENT

Henry L. Buijs, 2052 Dickson, Sillery, Quebec; Garry L. Vail, 35 Route Penney, Neuschatel, Quebec, both of Canada (G2A 3C5), and Jean-Noel Berube, 1425 des Metairies, Ancienne Lorette, Quebec, Canada (G2E 4J7)

Filed Jul. 30, 1980, Ser. No. 173,702
Claims priority, application Canada, Aug. 31, 1979, 334846
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **2 Claims**



1. In a spectrometer having a laser reference source providing a generally square-shaped beam, a beamsplitter-compensator, a fixed mirror and a moving mirror, a system for detecting variations in alignment between the mirrors including three detectors located adjacent the output field and arranged at the vertices of a triangle, and wherein stray reflections at the beamsplitter-compensator create laterally displaced ghost images of the reference source, the improvement comprising means orienting the beamsplitter-compensator with respect to the reference beam so that the ghost images are displaced along a diagonal of the square-shaped beam and a mask in the input laser beam restricting the laser beam to an L-shaped area which when it impinges on the output field includes the vertices of the triangle.

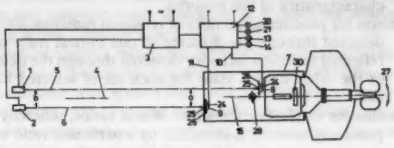
4,345,839

DEVICE FOR CONTROLLING THE POSITION OF A DRIFT ADVANCING MACHINE

Bernhard Droescher, and Alfred Zitz, both of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Jan. 23, 1980, Ser. No. 114,600
Claims priority, application Austria, Mar. 14, 1979, 1920/79
Int. Cl.³ G01B *11/00*
U.S. Cl. 356—400 **8 Claims**

1. In apparatus for controlling the position of a drift advancing machine along a desired drift axis, said machine having a longitudinal axis: two light beam sources or laser beam sources spaced longitudinally from the machine along the desired drift axis, said sources emitting beams which are parallel to each other and to the desired drift axis and which are in different vertical planes extending longitudinally of the drift; and two beam receivers arranged on the machine and longitudinally spaced-apart relative to the longitudinal axis of the machine, said receivers being in transversely spaced-apart positions relative to the longitudinal axis of the machine, and the transverse distance between said receivers corresponding to the transverse distance between the two beams.

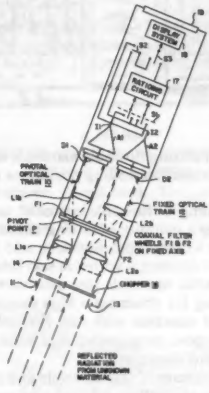


4,345,840

METHOD AND APPARATUS FOR INSTANTANEOUS BAND RATIOING IN A REFLECTANCE RADIOMETER

Alexander F. H. Goetz, Altadena, and Richard A. Machida, La Verne, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 8, 1980, Ser. No. 138,306
Int. Cl.³ G01J *3/50*; G01N *21/25*
U.S. Cl. 356—407 **9 Claims**



1. A method for providing instantaneous identification of particular reflecting materials by ratioing reflectance measurements at selected pairs of wavelength bands, each band of a pair being chosen for a particular spectral characteristic of a material of interest selected from a group consisting of spectral peaks and band wings on either side of spectral peaks for each band reflected from a particular material, comprising the steps of selecting a plurality of different paired bands, one pair at a time, for instantaneous band ratioing, simultaneously detecting the intensity of radiation reflected by materials under investigation into said plurality of predetermined bands centered on spectral characteristics of the different materials, determining the ratio of radiation intensity in at least one band to the radiation intensity in other bands, and displaying the band ratio thus determined to provide a ratio display indicative of the particular material, whereby a reflecting body can be checked for the presence of a plurality of different materials identified by at least one particular band ratio value for each material.

4. Apparatus for identifying an unknown material in a target area that reflects radiation within predetermined selected bands comprising

two optical trains directed independently at the same target area, each train having a detector for measuring the intensity of radiation reflected from the same target area, and

each train having a suitable filter for passing a different one of a set of selected bands of reflecting radiation, each one being selected to be centered on different spectral characteristics of the material,

means for producing the ratio of reflected radiation intensity detected through the detector of one optical train to the reflected radiation intensity detected through the detector of the other optical train for each set of selected bands, and

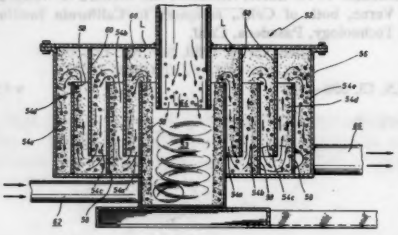
means for displaying the value of said ratios, whereby said particular material is identified by a particular ratio value.

4,345,841

MULTI-STAGE CENTRIFUGAL MIXER

Roger W. Day, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Jun. 20, 1980, Ser. No. 161,396
Int. Cl.³ B28C *5/06*
U.S. Cl. 366—2 **24 Claims**



23. A method for mixing flowable materials with solid materials for use in hydrocarbon drilling operations comprising the steps of:

tangentially feeding a flowable material into an annular housing having a plurality of mixing chambers for mixing so as to create a centrifugal motion in said flowable material resulting in forming a vortex in said flowable material;

axially feeding solid materials into said vortex within said annular housing for obtaining a high density mixture;

mixing said solid materials with said flowable materials by centrifugal motion, propagating said solid materials in a radially outward direction;

combining said mixture of said flowable and said solid materials by alternately spilling said mixture over and passing said mixture under a series of partition walls while maintaining the rotational velocity of said mixture in the same direction of rotation throughout said annular housing; and

tangentially discharging said mixture from said annular housing.

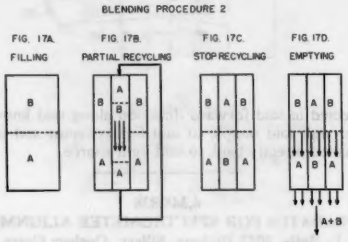
4,345,842

UNIVERSAL BLENDING METHOD FOR BLENDING THE MATERIAL CONTENTS OF A SILO

Ivan A. S. Z. Peschl, Kennedylaan 8, 6029 RE Sterksel, Netherlands

Filed Nov. 30, 1979, Ser. No. 99,038
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—137 **11 Claims**

1. A universal blending method for blending at least two types of materials initially provided in at least two horizontal layers of respective materials in a single silo having a predetermined interior cross-sectional area with respect to the longitudinal axis of said silo, said method comprising the steps of: initially discharging a partial vertical column of said materials into a collection area substantially in the downward direction of said longitudinal axis without substantially disturbing a vertically adjacent partial column of said materials, said initial discharging partial vertical column of material including an initial lower section of a first material type and an initial upper section of a second material type prior to the initial discharge thereof into said collection area, said initial discharging step causing at least a part of the material of said partial vertical column initial lower section to be discharged into said collection area while said partial vertical column initial upper section of material is vertically displaced into the area vacated by said discharged partial vertical column initial lower section; recycling said discharged material from said partial vertical column



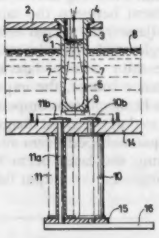
initial lower section from said collection area into the area vacated by said vertically displaced partial vertical column initial upper section, whereby a checkered pattern of the initial types of materials in said silo is provided between said two vertically adjacent columns of material when viewed as a vertical cross-section through the vertically adjacent columns of material; and simultaneously discharging said checkered pattern of vertically adjacent columns of materials into said collection area to provide a selected blended material.

4,345,843

AGITATOR

Erling G. Berglund, Jäfälla, and Hans J. Krook, Sollentuna, both of Sweden, assignors to Clinicon AB, Bromma, Sweden

Filed Feb. 23, 1981, Ser. No. 237,078
Claims priority, application Sweden, Mar. 11, 1980, 8001912
Int. Cl.³ B01F *13/08*
U.S. Cl. 366—219 **11 Claims**



1. An apparatus for shaking a test tube, comprising an holder with a circular hole therein in which a test tube can be hung by means of a flange, which flange projects outwardly from the upper edge of the test tube and which rests against the holder in a manner such that the test tube is r.stricted swingable outwardly, in all directions, from a substantially vertical rest position; a member of magnetic material attached to the lower end of the test tube; at least three stationarily arranged electromagnets each having a first pole and a second pole, said first poles of the electromagnets being arranged with their pole faces located in a common, substantially horizontal plane at a distance beneath the lower end of the test tube and on a circle substantially concentrical about the centre axis of the test tube in said rest position; and means for energizing the electromagnets in a given sequence so that the test tube, as a result of the

magnetic co-action between said magnetic member on the test tube and the said first poles of the electromagnets, is caused to effect substantially a nutational rotation around said rest position, with the point of the nutational rotation located substantially in the centre of the circular hole.

4,345,844

CALORIMETER

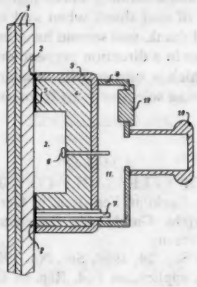
Marcel Birukoff, 10, route de la Gare, 1806 Saint-Legier, Vaud, Switzerland

Filed May 1, 1980, Ser. No. 145,816

Claims priority, application Switzerland, May 9, 1979, 4334/79

Int. Cl.³ G01K *17/00*

U.S. Cl. 374—31 **1 Claim**



1. A calorimeter comprising a heat-insulated enclosure having a recess that opens on one side of said enclosure and is adapted to be disposed against a surface whose heat flow is to be measured, a housing outside said enclosure and mounted on the other side of said enclosure for receiving temperature indicating means, and a temperature sensor that is disposed in part in said recess and extends through a side wall of said heat-insulated enclosure and terminates in said housing for said temperature indicating means, and an elastic gasket to seal the heat-insulated enclosure against the surface whose heat flow is to be measured, about the margins of said recess.

4,345,845

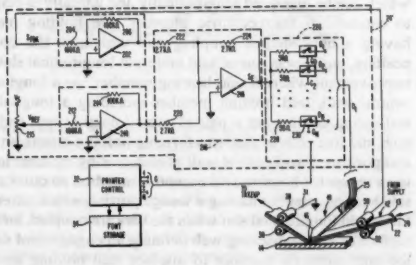
DRIVE CIRCUIT FOR THERMAL PRINTER

Alan E. Bohnhoff, Lexington, Ky.; Bruce M. Cassidy, Fairfax, Va., and Stanley Dyer, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,183

Int. Cl.³ B41J *3/02*

U.S. Cl. 400—120 **11 Claims**



1. For use in a printer of the kind that utilizes a thermal printing ribbon having a moderately conducting outer layer and a highly-conducting inner layer, said printer including a printhead with a set of electrodes that wipe over said moderately-conducting outer layer at a print zone to apply respective printing signals, timed in accordance with gating signals from a print controller, for causing localized heating within said ribbon and resultant mark formation at a receiving medium, printing signal circuitry comprising:

collection contact means for establishing electrical contact with said moderately conducting layer of said ribbon at a collection zone spaced from said print zone;

monitoring contact means for establishing electrical contact with said moderately conducting layer of said ribbon at a detection zone spaced from said print zone and said collection zone;

printhead energization means including,

a high impedance circuit, connected electrically to said monitoring contact means, for producing a buffered feedback signal representative of the electric potential assumed by said monitoring contact means;

signal channels coupled to respective of said electrodes,

signal processing means; responsive to said buffered feedback signal, for producing a set of printing signals, said signal processing means including means for adjusting a reference voltage level in accordance with said buffered feedback signal to produce an energization signal;

and switching means for selectively connecting said energization signal to said signal channels in accordance with said gating signals to act as respective printing signals at said electrodes; and

means defining a low impedance signal return path between said collector contact means and said printhead energization means whereby a return path for said printing signals is established.

4,345,846

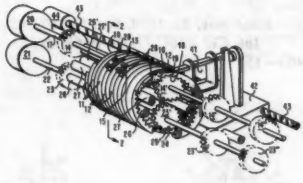
IMPACT PRINTER WITH DUAL HELIX CHARACTER PRINT ELEMENTS

Raymond D. Mathews, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1980, Ser. No. 193,879

Int. Cl.³ B41J *1/32*

U.S. Cl. 400—157 **8 Claims**



1. In an impact printer having a print member comprising type characters to be printed and a print hammer operable to impact selected ones of said type characters against a printing medium,

the improvement wherein said print member comprises

a first helical element having a first font of type characters arranged around its periphery, said first helical element being rotatably mounted so as to be linearly movable along an axis adjacent to said print medium,

a second helical element having a second font of type characters arranged around its periphery in the same direction as said first font, said second helical element being rotatably mounted along said axis in a position interspaced with said first helical element,

means for rotating and linearly moving said first helical element independently of said second helical element, and

means for rotating and linearly moving said second helical element independently of said first helical element,

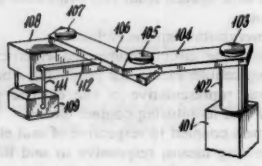
so that said helical elements are rotatable and linearly movable along said axis independent of each other.

4,345,847

AUTOMATIC BRAKE SEQUENCING FOR OVERHEAD SUPPORT ARM ASSEMBLIES

Charles M. Schiff, Aurora; Eric K. Maxon, Englewood, and Ronald E. West, Littleton, all of Colo., assignors to Technicare Corporation, Solon, Ohio

Filed Dec. 19, 1979, Ser. No. 105,360
Int. Cl.³ F16C 11/00
U.S. Cl. 403—103 6 Claims



1. In a system having an overhead arm assembly including at least three segments pivotably connected in sequence to one another and to a fixed member at three respective joints, apparatus for controlling locking and unlocking of said joints comprising:

(a) first brake means at a first joint between first and second ones of said segments;

(b) second brake means at a second one of said joints;

(c) operator actuated first control means for selectively releasing said first brake means to permit said second segment to pivot relative to said first segment;

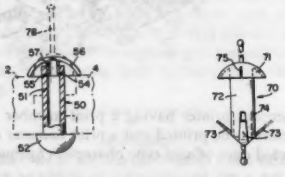
(d) second control means, for detecting the angular orientation of said first and second segments relative to one another, and for responsively controlling said second brake means for unlocking said second brake means when said first and second segments achieve at least a predetermined angular divergence from a condition of alignment.

4,345,848

SPECTACLE HINGE PIN

Stephen Cheselka, 87 Columbia St., Apt. 21-F, New York, N.Y. 10002

Filed Nov. 27, 1979, Ser. No. 97,842
Int. Cl.³ F16C 11/00; F16D 1/12
U.S. Cl. 403—157 8 Claims



1. A hinge pin device for spectacle hinges having a hinge pin or hinge screw opening (9), comprising:

an elongated shank (7) adapted to be received in the hinge opening (9) of the hinge, at least a portion of said shank being serrated (8) over a substantial portion of the length thereof and said serrations extending at least to the vicinity of one end of said shank, said shank having a length such that at least a portion of the serrated portion thereof extends out of the hinge opening (9);

a head member (5) on the end of said shank opposite said one end, said shank extending from said head member in a given direction, said head member (5) being impassible through said hinge opening (9);

a cap member (6) adjustably receivable over said one end of said shank and selectively engageable with at least one of said serrations which extends out of the hinge opening (9), said cap member having an opening smaller than the maximum diameter of the serrated portion (8) of said shank (7) for snappingly engaging said outwardly extending serrated portion of said shank to lock said cap onto said shank, said cap member being impassible through said hinge opening;

a first elongated handling member (78) coupled to said shank and extending from said head member in the longitudinal direction of said shank and in the direction opposite to the direction said shank extends from said head member, said first handling member having a cross section in a direction perpendicular to its longitudinal axis, which is substantially smaller than that of said shank, and being selectively breakable off from said shank; and

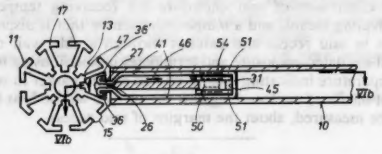
a second elongated handling member (78) coupled to said cap member and extending substantially in the longitudinal direction of said shank when said cap member is attached to said shank, said second handling member having a cross-section in a direction perpendicular to its longitudinal axis, which is substantially smaller than that of said shank, and being selectively off from said cap member.

4,345,849

FRAMEWORK OF RELEASABLY-CONNECTABLE BARS

Bruno Stenemann, Beckum, Fed. Rep. of Germany, assignor to Octanorm-Vertriebs GmbH für Bauelemente, Filderstadt, Fed. Rep. of Germany

Filed Sep. 24, 1980, Ser. No. 190,388
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941008
Int. Cl.³ F16B 7/04, 12/20
U.S. Cl. 403—252 14 Claims



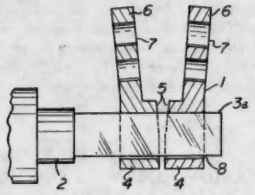
1. In a frame assembly of the type comprising separate, interconnected bars, of which at least some have undercut longitudinal slots which lockingly receive the coupling ends of coupling members that project from ends of other bars, said other bars each having a bearing member carrying a transversely oriented eccentric member which is rotatably operable from one external face of said other bar, and a holding member which can be displaced longitudinally and laterally in response to rotation of the eccentric member, the holding member having a hook-shaped coupling end which, in the coupled position, engages in one of said undercut longitudinal slots, the improvement wherein said bearing member has a longitudinal central wall, said holding member including a tongs-shaped leaf-spring comprising a pair of arms joined at one end by a web, the free ends of the arms forming holding means, an inner end portion of said central wall of said bearing member including a recess for housing said eccentric member, an outer end of said bearing member having a wedge portion which extends as far as said longitudinal slot when the bars are coupled, an inside surface of said leaf-spring web defining an engagement surface for said eccentric member to displace said holding member, said two arms of said leaf-spring having oppositely directed hooked ends and convergent sloping portions disposed adjacent said wedge portion which are spread apart by said wedge portion when the holding member is displaced inwardly by said eccentric member.

4,345,850

CLAMP-ON QUICK DISCONNECT ROTARY VALVE LINKAGE ARRANGEMENT

Hans D. Baumann, P.O. Box 471, Rye, N.H. 03870

Filed Jun. 22, 1981, Ser. No. 275,978
Int. Cl.³ B25G 3/20; F16B 2/14
U.S. Cl. 403—373 4 Claims



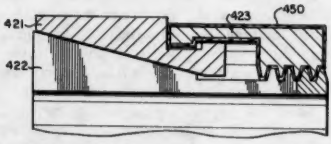
1. A rotary valve linkage arrangement consisting of a pair of levers having a central bore with at least two parallel flat surfaces engaging therewith a valve shaft having a similar but slightly smaller cross sectional profile than that of said lever bore, said levers further having each an extended arm portion encompassing therein one or more bores placed at some radial distance from the shaft axis and capable of engaging suitable fastening means, each of said levers having additional hub portions extending in width beyond the thickness of said extended arm portions and terminating in contact surfaces facing each other, said arms being urged towards each other by suitable fastening means to cause a tilting action of both levers around the contact surfaces of the extending hub portions facing each other and thereby causing tight engagement between the parallel surfaces of said shaft and lever bores.

4,345,851

MOUNTING DEVICE

Dimitri G. Soussloff, Wyomissing, Pa., assignor to Harrington Hoists, Manheim, Pa.

PCT No. PCT/US79/00480, § 371 Date Mar. 10, 1980, § 102(e) Date Feb. 15, 1980, PCT Pub. No. WO80/00179, PCT Pub. Date Feb. 7, 1980
Continuation-in-part of Ser. No. 923,056, Jul. 10, 1978. This PCT application Jul. 10, 1979, Ser. No. 179,286
The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.
Int. Cl.³ F16B 2/14
U.S. Cl. 403—369 7 Claims



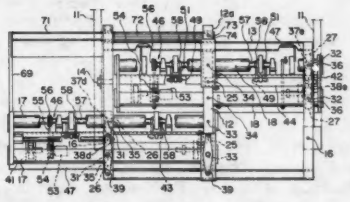
1. A mounting device for mounting a machine element having a cylindrical bore coaxially on a shaft having a cylindrical surface, said device comprising a segmented inner sleeve encircling the shaft, said inner sleeve comprising an integral member having a straight cylindrical interior bore corresponding in diameter to the external cylindrical surface of said shaft and having a tapered external surface, the segments of said inner sleeve providing a plurality of terminated axial slots extending longitudinally of said sleeve each extending from one end of the sleeve and terminating short of the other end, and a single axial through-slot extending from end to end of the sleeve to permit contraction and expansion of said interior bore, said device also comprising a segmented outer sleeve encircling said inner sleeve, said outer sleeve having a tapered internal surface corresponding in angle of taper to the tapered external surface of said inner sleeve and having a straight cylindrical outer surface corresponding in diameter to the cylindrical bore of said machine element, said segmented outer sleeve comprising a plurality of separate separable segments, one end of said inner sleeve having external threads, the corresponding end of said outer sleeve having circumferential interlock means providing opposed forward and rearward radial surfaces substantially perpendicular to the central axis of the shaft, a clamping nut threadedly engaged with the threaded end of said inner sleeve, said nut having cooperating circumferential interlock means defining opposing forward and rearward drive surfaces confronting the corresponding surfaces of the interlock means of said outer sleeve, whereby upon rotation of said nut in one direction, the forward surfaces of the respective interlock means engage and effect relative axial displacement of said sleeves in one direction, and upon rotation of said nut in the opposite direction, the rearward surfaces of the respective interlock means engage and effect relative axial displacement of said sleeves in the opposite direction, said displacements causing said tapered surfaces to expand and contract the interior bore and to contract and expand the exterior surface of said outer sleeve, and anti-friction means reducing the friction opposing rotation of said nut.

4,345,852

LEVELING DEVICE FOR ASPHALT FINISHER

Fumio Goto, Gunma; Kenji Yoshino, Takasaki; Hiroshi Kono, Urawa, and Mitsuaki Naito, Koganei, all of Japan, assignors to Niigata Engineering Co., Ltd. and Nippon Hodo Co., Ltd., both of Tokyo, Japan

Filed Mar. 6, 1980, Ser. No. 127,628
Claims priority, application Japan, May 14, 1979, 54/63837[U]
Int. Cl.³ E01C 19/38
U.S. Cl. 404—114 7 Claims



7. A leveling device for an asphalt finisher or the like comprising:

(a) a front screed and rear screed positioned respectively at front and rear portions of said device on opposite lateral positions thereof,

(b) means for mounting said front and rear screeds on a vehicle body wherein both of said screeds are movable laterally and tiltable sidewards, said mounting means comprising, for each of said screeds,

a main frame;

a pair of supporting arms adapted at one end to be pivotally coupled to said vehicular body;

means for pivotably supporting said main frame on said supporting arms;

crown adjustment screws;

an auxiliary frame coupled to said main frame; said auxiliary frame being positioned at a central portion of said main frame and being movable vertically relative to said main frame by means of said crown adjustment screws, said screeds being supported by said main frame and said auxiliary frame;

a first set of bearing means and a second set of bearing means

adapted to support said screeds thereon, said first set of bearing means being disposed in said auxiliary frame, said second set of bearing means being disposed in said main frame;

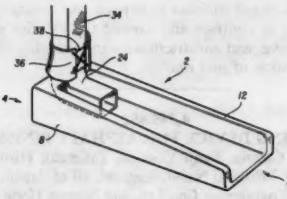
first and second set of screed height adjusting screws, said first set of screed height adjusting screws being connected to said first set of bearing means to control vertical positions thereof relative to said auxiliary frame, and said second set of screed height adjusting screws being connected to said second set of bearing means to control vertical positions thereof relative to said main frame.

4,345,853

LIGHT WEIGHT RUN-OFF TROUGH

Stanley P. Fisher, 10110 Walker Lake Dr., Great Falls, Va. 22066

Filed Aug. 5, 1980, Ser. No. 175,538
Int. Cl.³ E04D *13/08*; E02B *9/04*
U.S. Cl. 405—119 **10 Claims**



1. A run-off trough for a down spout, comprising:

a hollow body having at least a rear end including a substantially vertical surface, a front end and a top surface;

a first depression in said top surface and forming a trough; and

means on said substantially vertical surface for attaching said trough to a vertical portion of said down spout,

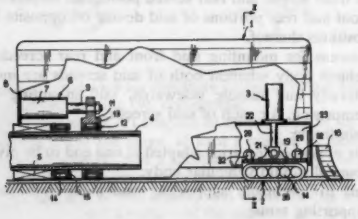
wherein said means for attaching comprise a portion of said substantially vertical surface, said portion including arm means, and at least said arm means of said portion being separable from the remainder of said substantially vertical surface.

4,345,854

APPARATUS FOR LAYING UNDERWATER PIPELINES

Alfred Valantin, Clermont, France, assignor to Techniques Industrielles et Minieres, Paris, France, a part interest

Filed Jun. 26, 1979, Ser. No. 52,238
Claims priority, application France, Jun. 29, 1978, 78 19467
Int. Cl.³ F16L *1/04*
U.S. Cl. 405—159 **19 Claims**



1. A device for utilizing an auxiliary vessel in order to lay pipelines which are submerged at the bottom of the sea and connected to at least one point of the coast,

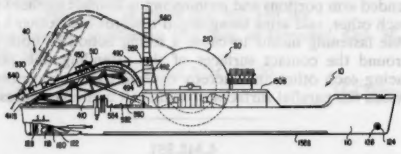
comprising an underwater vehicle provided with means for traveling along the sea bed, means for providing a flexible connection with the vessel, means for fabricating the pipe within the vehicle at least to a partial extent, and means for withdrawing the pipe from the vehicle progressively as it is being fabricated and for placing said pipe on the sea bed, wherein the means for fabricating the pipeline are such that the internal space of the vehicle is in communication with the internal space of the entire pipeline which has already been laid, said means for withdrawing the pipeline from the vehicle comprising two rings of elastic and high-strength material each provided with a selectively inflatable cavity in order to ensure leak-tight cooperation of said ring with said pipeline, at least one of said rings being mounted on an annular piston which is capable of sliding longitudinally with respect to the vehicle, and jack means acting between said piston and the vehicle to withdraw the pipe from the vehicle.

4,345,855

SELF PROPELLED DYNAMICALLY POSITIONED REEL PIPE LAYING SHIP

Stanley T. Uyeda, Orange; E. John Radu, Fountain Valley; William J. Talbot, Jr., Corona Del Mar, and Norman Feldman, Huntington Beach, all of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Division of Ser. No. 35,216, May 2, 1979, Pat. No. 4,269,540, which is a continuation-in-part of Ser. No. 903,181, May 5, 1978, abandoned. This application May 18, 1981, Ser. No. 264,958
Int. Cl.³ F16L *1/00*; B63B *35/04*
U.S. Cl. 405—168 **26 Claims**



1. A reel pipelaying vessel, comprising a reel mounted thereon and pipe conditioning means located downstream of the reel in the direction of unspooling, said pipe conditioning means, including:

radius control means for imparting a substantially uniform curvature to the pipe after it is unspooled from the reel;

straightening means for imparting a reverse bending force to the pipe opposite the curvature imparted by said radius control means, said straightening means having a plurality of reaction means for exerting relatively opposed reaction forces on the pipe; and

means for cooperatively adjusting the radius control means and straightening means relative to the nominal pipe path to adjust the pipe support surfaces of the radius control means and straightening means relative to the pipe path, to thereby maintain the pipe path at the exit end of the straightening means substantially the same for different pipe diameters whereby pipe exiting the straightening means is optimally subject to substantially no net bending stresses and substantially no net residual bending strains.

4,345,856

COMPOSITION AND PROCESS FOR STABILIZING EMBANKMENTS

Philip C. Tuck, 192 Spring St., West Bridgewater, Mass. 02379

Filed Nov. 28, 1979, Ser. No. 97,690
Int. Cl.³ E02B *3/04*; E02D *17/20*
U.S. Cl. 405—258 **20 Claims**

4. A method for grading and stabilizing an embankment comprising applying to the surface of said embankment in depths of about 2–4 feet, as measured perpendicular to the embankment, in the absence of any artificial supporting means a mixture consisting essentially of rip rap and loam wherein said rip rap consists essentially of a mixed aggregate of pro-

cessed stone ranging in size from about 6–18 inches in diameter in which at least about 25% of said rip rap is less than 10 inches in diameter and at least about 25% is greater than 10 inches in diameter, and the porportion by volume of loam to rip rap is from about 1–10 to 1–2.

19. A method for constructing and stabilizing an embankment comprising the following steps:

(a) constructing a first pair of rip rap embankments on either side of a space to be filled stabilized;

(b) filling said first pair of rip rap embankments with loam and the cavity therebetween with gravel or fill;

(c) constructing a second layer of rip rap embankments on top of said first pair of embankments followed again by filling said embankments with loam and the cavity therebetween with gravel or fill; and,

(d) constructing successive layers in a similar manner until said embankment attains the desired height.

4,345,857

CONSTRUCTION PLATE FOR A DITCH CONSTRUCTION DEVICE

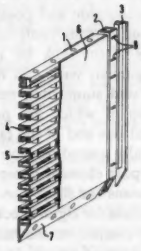
Josef Krings, Hans-Böckler-Str. 23, D-5138 Heinsberg-Oberbruch, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 210,720

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948458

Int. Cl.³ E21D *5/12*

U.S. Cl. 405—282 **12 Claims**



1. In a construction plate for a ditch construction device of the type comprising profiled steel elements which are rigidly coupled together, cover plates covering said steel elements and profiled steel elements in the form of hollow profiles mounted adjacent the small sides of the construction plate and provided with guide heads for coupling adjacent supports or construction plates, the improvement comprising:

at least one vertically-disposed hollow profile having a wall facing the inner side of said construction plate and having a plurality of vertically spaced-apart and aligned horizontally-disposed slot openings formed therein;

a profiled guide bar having a rear side rib with a plurality of vertically spaced-apart and aligned horizontally-extending joint plates disposed for insertion through said openings of said hollow profile, said joint plates each having vertically-extending and aligned throughput openings formed therein vertically aligned with the throughput openings of the other plates; and

a locking rod insertable through said throughput openings, said locking rod having wedge elements for engaging said joint plate and/or hollow profile.

4,345,858

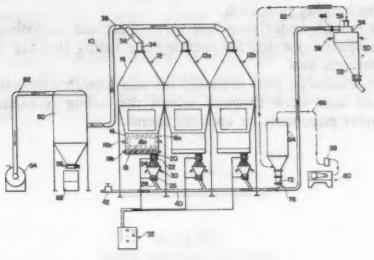
PARTICULATE MATERIAL DISPENSING AND WEIGHING SYSTEM AND METHOD

Robert C. Barlow, Bridgeville, Del., assignor to O. A. Newton & Son Company, Bridgeville, Del.

Filed Aug. 25, 1980, Ser. No. 180,923

Int. Cl.³ B65G *53/66*

U.S. Cl. 406—34 **9 Claims**



1. Apparatus for dispensing pre-selected quantities of multiple particulate material ingredients comprising:

(a) plural storage hopper means, one for each of a plurality of ingredients,

(b) plural ingredient weigh scales, one for each of said ingredients,

(c) means for discharging the ingredient from each storage hopper means to a respective weigh scale,

(d) a pneumatic ingredients delivery conduit,

(e) means for delivering ingredient from each said weigh scale to said delivery conduit, and

(f) means for receiving and for weighing the total quantity of material delivered by said delivery conduit,

(g) whereby the total quantity of material delivered is compared with the sum of the weights indicated by said ingredient weigh scales.

4,345,859

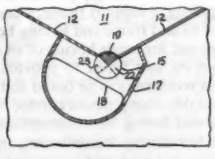
HOPPER DISCHARGE VALVE

Harry G. Robertson, Chicago, Ill., assignor to Edsco, Inc., Evergreen Park, Ill.

Filed Jun. 2, 1980, Ser. No. 155,615

Int. Cl.³ B65G *53/46*

U.S. Cl. 406—128 **8 Claims**



1. A hopper discharge structure having a discharging valve for evacuating granular-like lading from hopper cars and the like comprising:

(a) a hopper structure providing end walls and inclined side

walls, the confronting lower edges of which are spaced apart to provide a discharge opening therebetween,

(b) a cylindrical valve shaft rotatably supported between said end walls along a line parallel to said discharge opening formed between said inclined side walls,

(c) said valve shaft having its axis of rotation located equally between and along a line beneath said confronting lower edges of said inclined side walls with said valve shaft having a diameter such that a portion of its periphery sits within and closes said discharge opening,

(d) said valve shaft providing a plurality of channels formed in selective portions thereof, with one channel in one portion extending throughout the length of said valve shaft, and with partial channels formed in adjacent portions and of a length less than said one channel and on diametrically opposite sides thereof,

(e) means for rotating said shaft within said discharge opening so as to position said channels into selective lading discharging positions,

(f) a trough underlying said valve shaft and enclosing said discharge opening for reciving the lading flowing therethrough, and

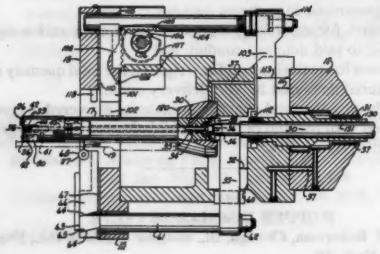
(g) a discharge port mounted on said trough externally of said side walls through which the lading is exhausted under pneumatic or vacuum means.

4,345,860

BORING MACHINE AND METHOD OF RIGIDIZING A BORING BAR

Alex Shashaty, 41562 Lodge Rd., Leetonia, Ohio 44431

Filed Jul. 14, 1980, Ser. No. 168,599
Int. Cl.³ B23B *35/00, 51/08*
U.S. Cl. 408—1 R **10 Claims**



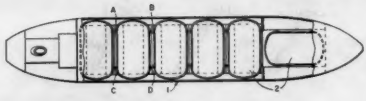
1. A boring machine for boring pipe ends or other elongated workpieces comprising, a support frame, a boring bar secured at one end thereof to said frame and having boring tool means on its other or free end for inside boring of an elongated workpiece, drive means on said frame to provide relative boring rotation between a workpiece to be bored and said boring bar, and radially retractable clamp means carried by said frame for radially clamping said boring bar intermediate its ends to rigidly support said bar during initial boring operations on an elongated workpiece and adapted for outward radial retraction to coaxially pass a workpiece end being internally bored over said bar past said clamp means after completion of said initial boring operations, said drive means including a spindle journaled for rotation on its axis in said frame, a motor in rotary driving engagement with said spindle, said boring bar axially aligned with said spindle and said one end thereof secured to one end of said spindle, said radially retractable clamp means being rotatably carried by said one end of said spindle.

4,345,861

UNIVERSAL TANK AND SHIP SUPPORT ARRANGEMENT

Harald Aarseth, Marsveien 2, N-1500 Moss, Norway

Filed Nov. 21, 1979, Ser. No. 96,365
Claims priority, application Norway, Nov. 24, 1978, 783969
Int. Cl.³ B61D *5/06;* **B63B** *25/16;* **B65D** *88/74, 90/06*
U.S. Cl. 410—68 **4 Claims**



1. A system for supporting a large, generally cylindrical horizontal tank on a carrier and for accommodating movements of the tank due to thermal contraction and expansion and carrier movements comprising four supports arranged fore and aft of the tank and on each side of the longitudinal axis thereof, said four supports having tank portions rigidly secured to the tank and carrier portions mounted to the carrier by means rigidly securing the carrier portion of one said support to said carrier and slidably connecting the carrier portions of the other three said supports to the carrier for horizontal movement of the tank and said three supports relative to the carrier, and spherical ball and socket joint means interposed between said tank and carrier portions of said supports for accommodating relative movement between said tank and carrier portions of said supports.

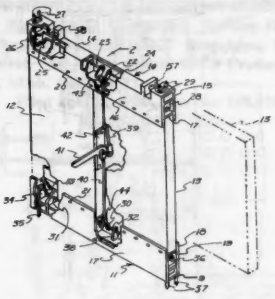
2. A system for supporting a large, generally cylindrical tank in the hull of a ship positioned with its longitudinal axis parallel with the horizontal, and for accommodating movements of the tank due to thermal expansion and contraction and to movements of the ship, said system comprising means extending around the periphery of the tank for reinforcing the same, means in vertical alignment with said reinforcing means for supporting the tank, said supporting means comprising four support elements, two of which are positioned in laterally spaced relation toward one end of the tank and two of which are positioned in laterally spaced relation toward the other end of the tank, each support element comprising a tank portion and a hull portion, means for rigidly securing each said tank portion to the tank, means for rigidly securing the hull portion of a first said support element to the hull, means for slidably connecting the hull portion of a second said support element to the hull, transversely spaced from the first mentioned support element for movement of the second support element only in transverse directions relative to the axis of the tank, means for slidably connecting the hull portion of a third support element to the hull longitudinally spaced from said second mentioned support element for movement of the third support element only in directions parallel to the longitudinal axis of the tank and means for slidably connecting the hull portion of a fourth said support element transversely spaced from said third mentioned support element for movement of the fourth element in both transverse and parallel directions, the tank portions of each support element being connected with its respective hull portion by spherical joint means for rotational movement therebetween, and thermal insulation being provided between the parts of said spherical joint.

4,345,862

MODULAR FREIGHT BRACING BULKHEAD ASSEMBLY

Bennett O. Blout, Berwyn, and James C. Ruffolo, Country Club Hills, both of Ill., assignors to Evans Products Company, Portland, Oreg.

Filed Nov. 17, 1980, Ser. No. 207,406
Int. Cl.³ B60P 7/014
U.S. Cl. 410—134 2 Claims



1. A freight bracing bulkhead adapted to be suspended from a trolley cooperating with overhead tracks in a cargo area comprising an upper frame and a lower frame, said upper frame having spaced apart vertical members connected by a horizontal member which define a downwardly facing channel in said upper frame, said lower frame having spaced apart vertical members connected by a horizontal member which define an upwardly facing channel in said lower frame, two panel members extending between said upper and lower frames, the upper ends of said panel members being received in the downwardly facing channel of said upper frame and the lower ends of said panel members being received in the upwardly facing channel of said lower frame, means removably connecting said panel members to said upper and lower frames, each of said panels having a horizontal dimension that is greater than one-third the length of said upper and lower frames but less than one-half the length thereof, locking means located at the ends of said upper and lower frames and movable between an extended, locked position to a retracted, released position, and linkage means communicating said locking means with actuation means for moving said locking means between said locked position and said released position, said linkage means and said actuation means being located exteriorly of said panel means.

4,345,863

NUT CONTROL DEVICE

Haruo Mochida, Yokohama, and Tetsuo Kobayashi, Ikeda, both of Japan, assignors to Nissan Motor Company, Limited and Nippon Cable System, Inc., both of, Japan

Filed May 16, 1980, Ser. No. 150,623
Claims priority, application Japan, Jul. 13, 1979, 54-89130
Int. Cl.³ F16B 37/12
U.S. Cl. 411—252 2 Claims

1. A control device for preventing a nut from loosening, comprising:

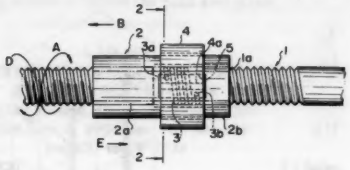
a first member having an external thread portion;

a second member having an internal thread portion screwed with the external thread portion and an opening;

a locking coil which is wound around the external thread portion of the first member and has at its both ends bent portions to be selectively engaged with the opposite sides of the opening of the second member; and

a third member which is loosely rotatably fitted in the opening of the second member and has a projection which is engaged or disengaged with the bent portions of the locking coil,

wherein the opening of the second member is a rectangular aperture formed in its longitudinal direction, and the bent portions of the locking coils and the projection of the third



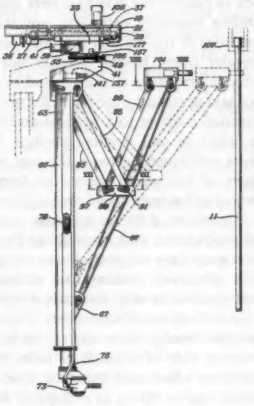
member are placed within the rectangular aperture thereof in such a manner that a certain clearance can be set between the side walls of the rectangular aperture of the second member and the bent portions of the locking coil, the projection of the third member being between the bent portions of the locking coil.

4,345,864

PIPE MANIPULATOR

Roger Smith, Jr., and Faustyn C. Langowski, both of Georgetown, Tex., assignors to BJ-Hughes Inc., Round Rock, Tex.

Filed Mar. 17, 1980, Ser. No. 130,762
Int. Cl.³ E21B 19/15
U.S. Cl. 414—22 4 Claims



1. Apparatus for moving stands of pipe in a derrick, said apparatus comprising:

a powered turret for rotation about a generally vertical axis;

mounting means for positioning said turret at a selected location relative to the derrick;

a generally vertical leg supported and rotated by the turret;

a powered dolly mounted for movement and selected positioning along the vertical leg;

a power arm having one end rotatably mounted to the dolly;

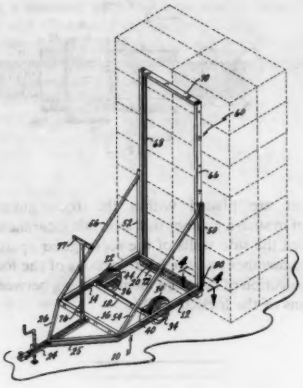
a pipe gripping head mounted to the opposite end of the power arm; and

a scissor arm having one end rotatably connected to the power arm and the other end rotatably connected to a selected one of the leg and the turret.

4,345,865
STACK STARTER

Joseph E. Jager, 44022 N. 75th St. East, Lancaster, Calif. 93534

Continuation of Ser. No. 34,470, Apr. 30, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 206,718
Int. Cl.³ B60P 1/04
U.S. Cl. 414—35 1 Claim



1. An implement for starting and stabilizing stacked bales of hay on the surface of the ground, stacked by tilting from a transport vehicle comprising:

a wheel-supported frame said frame having a pair of horizontally extending parallel side members, a transverse end member connected to and extending between the inner sides of the parallel side members and spaced inwardly from the respective ends of the side members and a pair of vertically upstanding members extending upwardly from the upper end surfaces of the parallel side members;

a rectangular frame having parallel side elements pivotally mounted intermediate its ends to and between the upper free ends of said upstanding members for pivotal movement from a horizontal position to a vertical position, said rectangular frame when in said vertical position having its said side elements positioned between the said ends of the said side members of the wheel supported frame and against said transverse end member, said rectangular frame, when in said vertical position, defining a planar vertical surface free of lateral projections; said rectangular frame when in vertical position extending substantially to the ground;

means for selectively locking said rectangular frame in said vertical position to said vertically extending members adjacent the ends of the side members whereby said rectangular frame is in a fixed position and serves to engage and stabilize the vertical side of a stack of bales opposite a transport vehicle from which said bales are tilted to thereby stabilize said stack against tilting or collapsing away from said vehicle, the implement including the frame being movable away from stack leaving it standing, said wheel—supported frame is provided with an upright member, located at the other end of said frame from said upstanding members, for engaging and supporting said rectangular frame in a horizontal position for transporting said implement.

4,345,866
LOADER-UNLOADER SYSTEM FOR WORK PIECES

Larry D. Greene, Centralia, Ill., assignor to Acco Industries Inc., Bridgeport, Conn.

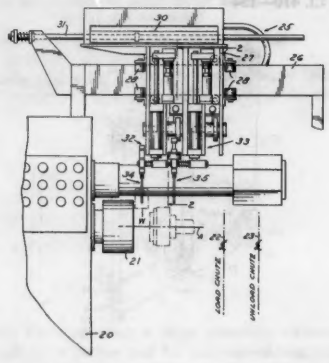
Filed Feb. 22, 1980, Ser. No. 123,496
Int. Cl.³ B23B 13/00
U.S. Cl. 414—224 14 Claims

6. A load-unload head for loading and unloading a workpiece into a machine tool wherein each workpiece is held in position for rotation about a longitudinal axis comprising

a body,

a set of fingers,

means for mounting said fingers on said head for linear movement radially toward and away from one another for gripping and releasing a workpiece,



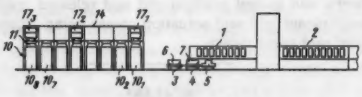
and means for moving said fingers toward and away from one another in said linear path,

means associated with said head for rotating said head about an axis at a right angle to the axis of the workpiece being loaded said means for rotating being such that a workpiece in the machine tool can be gripped, removed from the machine tool, rotated and re-inserted in the machine tool to permit machining of an opposite surface thereof.

4,345,867
COKE DRY QUENCHING PLANT

Alexandr N. Minasov, ulitsa Ivanova, 12/16, kv. 59; Alexandr N. Suslov, ulitsa Karla Marxa, 38 E, kv. 42, both of Kharkov; Alexandr A. Azimov, ulitsa Oktyabrskoi revoljutsii, 25, kv. 11, and Gennady N. Marapulets, ulitsa Lyzenko, 40, both of Slavyansk, all of U.S.S.R.

Filed Mar. 10, 1980, Ser. No. 128,503
Int. Cl.³ C10B 39/02
U.S. Cl. 414—287 7 Claims



1. A coke dry quenching plant comprising:

vertical quenching chambers, said chambers each being arranged in a row and each including an associated coke-charging means corresponding thereto and installed in an upper part thereof;

hoisting shafts, one of said hoisting shafts for each said vertical quenching chambers, and each said hoisting shaft being mounted opposite an associated one of a corresponding vertical quenching chamber;

a body for carrying coke;

lifts operatively movable relative to and interacting with said hoisting shafts, each said lift including a carriage for transporting said body from one of said hoisting shafts to and from the coke-charging means of its said corresponding vertical quenching chamber;

a trestle justaposed to an exit end of said hoisting shafts, rails on said trestle and positioned on a level thereof where said lift exits from said exit of said hoisting shafts, said body

being movable on said trestle and guided by said rails for movement along said vertical quenching chambers;

a railway line laid on a side of said vertical quenching chambers on a level of the location of said rails of said trestle perpendicularly to said rails and interacting with said undercarriage of said lift carriage; and

means for transferring said body in a horizontal plane along said trestle and perpendicularly thereto.

4,345,868

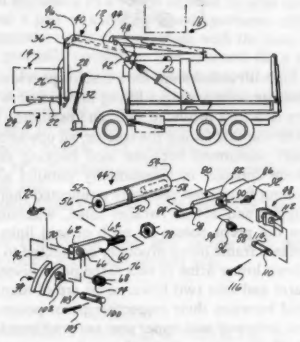
WASTE RECEPTACLE DUMPING MECHANISM

Charles P. Rizzo, 33552 Chatsworth, Sterling Heights, Mich. 48077; Stephen Barraco, 55327 Broughton, Mt. Clemens, Mich. 48044, and James Quinn, 40900 Production Dr., Mt. Clemens, Mich. 48045

Filed Jul. 21, 1980, Ser. No. 169,515

Int. Cl.³ B65F *3/00*

U.S. Cl. 414—408 **1 Claim**



1. An improved waste receptacle dumping mechanism including a vehicle mounted cylinder actuated mechanism for engaging and translating a waste receptacle from a first position in front of said vehicle to a second position over a waste receiving opening at a rear portion of said vehicle; a fork associated with said mechanism for releasably engaging the receptacle, cylinder means for pivoting the fork and dumping the contents of the receptacle into the waste receiving opening, the fork supported by a pair of spaced vertical arms each having a lower end and an upper end, each of the lower ends pivotally engaging the fork, a pivot support spaced downward from each of the upper ends of the vertical arms pivotally engaging a forward end of a pair of spaced swinging arms, each swinging arm including a rear end pivotally supported by the vehicle; a pair of adjustable stabilizer rods including a front end pivot attached to the upper ends of the vertical arms and a back end pivot pivotally attached to the vehicle, the stabilizer rods and their pivots configured to stabilize the waste receptacle in a horizontal position as the swinging arms translate the receptacle from the first position to the second position, the adjustable stabilizer rods comprising:

a central rod including a rod front end and a rod back end;

a threaded bore formed longitudinally in the rod front end;

a central bore formed longitudinally in the rod back end;

a front end bearing support including an enlarged end and a threaded end, the enlarged end including a first bearing bore formed therein, a first roller bearing snugly pressed into the bearing first bore;

lock means threadingly engaging the threaded end of the front end bearing support, the threaded end threadingly engaging the threaded bore in the rod front end;

a rear end bearing support including an enlarged end and a cylindrical end, the large end including a second bearing bore formed therein, a second roller bearing snugly pressed into the second bearing bore, the cylindrical end slidingly engaging the central bore in the rod back end, a shoulder formed at an inner end of the cylindrical end, the shoulder secured to the central rod;

a first pin snugly engaging an upper end aperture formed in the vertical arm upper end and slidingly engaging the first roller bearing rollers to define the front end pivot; and

a second pin snugly engaging a pair of aligned apertures formed in the vehicle and slidingly engaging the second roller bearing rollers to define the back end pivot.

4,345,869

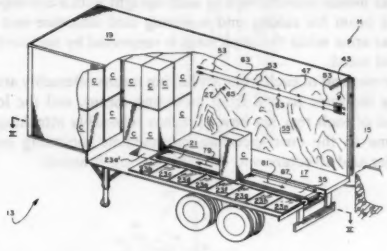
CONVEYOR SYSTEM FOR LOADING AND UNLOADING TRUCKS AND TRAILERS

John L. King, 1740 Kansas, Memphis, Tenn. 38109

Filed Nov. 3, 1980, Ser. No. 203,644

Int. Cl.³ B60P *1/38*

U.S. Cl. 414—520 **4 Claims**



1. The combination with a cargo transport truck of the type having a cargo body of self-contained powered conveyor means for assisting in the loading and unloading operation wherein the improvement comprises: variable traverse means for: (1) selectively and progressively abating and augmenting respectively the effective length of the conveyor means commensurate with the loading and unloading operation, and (2) enabling the entire cargo floor area of the cargo body to be utilized in restingly supporting cargo although any likelihood of having cargo directly supported upon the conveyor means during transport of the truck may be avoided for enabling the conveyor means to be effectively operated when the cargo body may be fully loaded as well as when it may be empty and the various stages therebetween; and manually operable control means for selectively enabling said conveyor means to be operated in forward and reverse directions and to cease operation, said control means including a first control means including a first control member being readily accessible along and extending substantially the entire length of the cargo body and a second control member being readily accessible along and extending substantially the entire length of the cargo body and substantially coextensive with said first control member, a manual action on said first control member causing said conveyor means to travel in a forward direction, a manual action on said second control member causing said conveyor means to travel in a reverse direction.

4,345,870

QUICK ATTACH LOADER

Carl M. Anderson, and Vernon L. Losey, both of Claremore, Okla., assignors to Hesston Corporation, Hesston, Kans.

Filed Jun. 16, 1980, Ser. No. 159,767

Int. Cl.³ E02F *3/70*

U.S. Cl. 414—686 **10 Claims**

1. In combination with a tractor having a front mounting means and a pair of intermediate mounting means, one on each side respectively of the tractor, a materials handling implement including:

a frame structure having a pair of laterally spaced, interconnected side units,

each unit including an elongated, fore and aft bar having a

front leg secured thereto and depending therefrom and a rear upright secured thereto, each upright being provided with an upstanding post and a rear leg depending from the bar;

a boom assembly having a pair of laterally spaced, interconnected lifting beams,

each beam including a fore and aft rear arm and a forwardly extending front arm;

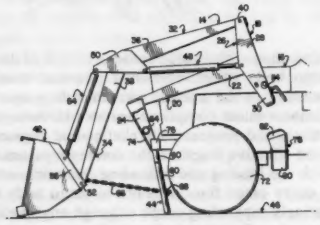
pivot means connecting the rear ends of the rear arms with the upper ends of the corresponding posts for up and down swinging movement of said assembly relative to said structure;

a materials handling tool mounted on the forward ends of said front arms;

a stand mounted on the lower ends of said front legs and cooperable with said tool in rendering the implement free standing and self supporting; and

power means interconnecting each upright with a corresponding beam for raising and lowering said structure and said rear arms while the implement is supported by said tool and said stand,

the lower end of each front leg having means releasably attaching the same to said front mounting means, and the lower end of each rear leg having means releasably attaching the same to the corresponding intermediate mounting means after said structure and the rear legs are lowered,



said front mounting means comprising a crosspiece, said front legs having a cross member interconnecting the same and resting on the crosspiece.

6. The method of mounting a materials handling implement on a tractor,

said implement having a frame structure provided with a stand depending from its forward end, a boom assembly mounted on said structure for up and down swinging movement, a materials handling tool carried by said assembly, and power means between said structure and said assembly for swinging the latter,

said implement being ground supported by the bucket and the stand when the implement is detached from the tractor,

said method including the steps of:

driving the tractor forwardly to position its front end adjacent the stand;

actuating the power means to swing said structure downwardly while the implement is supported by the tool and the stand until said structure engages the tractor at a number of locations on the latter; and

attaching the structure to the tractor at each of said locations,

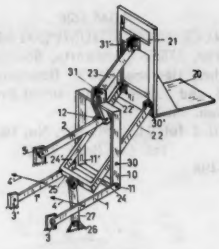
said structure having a front cross member and a pair of spaced rear legs, said tractor having a front crosspiece and a pair of spaced pockets, said method including the downward swinging of said structure until the rear legs enter the pockets and the cross member descends toward and comes to rest on the top of the crosspiece at substantially the same time.

4,345,871

HIGH-LIFT ATTACHMENT FOR AN AGRICULTURAL TRACTOR PROVIDED WITH A THREE-POINT LINKAGE

Eitan Kalif, 20b Yehoshua St., Afula, Israel

Filed Apr. 2, 1980, Ser. No. 136,469
Int. Cl.³ B66F *9/06*
U.S. Cl. 414—703 **5 Claims**



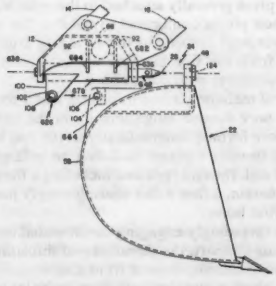
1. A high-lift attachment for a tractor provided with a three-point linkage, comprising a lifting implement in the form of a platform or a fork provided with an upstanding backing frame or wall on the side facing the tractor; an upstanding intermediate frame positioned between said backing frame and said three-point linkage, in substantially parallel alignment with said backing frame and pivotally connected thereto by at least three upper and lower parallel links, wherein the distance between the pivot points on each of said links is equal, said intermediate frame being pivotally connected to the upper arm and to both lower arms of said three-point pivot, wherein said upper arm and said two lower arms are of identical length as measured between their respective pivot points, and wherein the pivot points of said upper arm are positioned rearwardly in respect of the pivot points of said lower arms, both on the tractor and on said intermediate frame; at least one of said links connecting said intermediate frame to said backing frame being provided with an elongated portion extending beyond said intermediate frame in the direction of said tractor linkage; means being provided for urging said elongated portion in a downwards direction.

4,345,872

CONNECTORS

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Inc., Hubbardston, Mass.

Filed Jul. 10, 1978, Ser. No. 923,379
Int. Cl.³ E02F *3/70*
U.S. Cl. 414—705 **8 Claims**



1. In apparatus for releasably securing a materials handler to a boom while permitting rotation of said materials handler relative to said boom about relatively perpendicular first and

second axes, said second axis being on the side of said boom opposite said first axis and said apparatus including a hitch adapted for pivotal connection to said boom for rotation about said first axis and for connection to said materials handler for providing said rotation about said second axis, that improvement comprising:

a first connector system including a first hitch connector adjacent said first axis and a first materials handler connector, said first hitch connector having (i) a projecting axially-fixed pin attached to said hitch and extending generally along said second axis and having a circular in cross-section tapered nose at one end thereof and (ii) a cylindrical sleeve surrounding said pin, and said first materials handler connector including a member projecting upwardly beyond the top of said material handler and defining an aperture for receiving said projecting nose of first hitch connector pin when said hitch and said handler are moved relatively together;

a second connector system spaced from first connector system and including (i) a recess defined by said materials handler and a pair of axially aligned apertures extending through opposite walls of said recess with the axes of said apertures generally parallel to said axis and (ii) a projection defined by said hitch and arranged to fit within said recess when said tapered nose is fitted within said aperture of said first connector system;

an arm attached to said sleeve, defining said projection of said connector system and extending downwardly into said recess in a direction generally perpendicular to said second axis; and,

means for rotating said sleeve and said arm about said second axis,

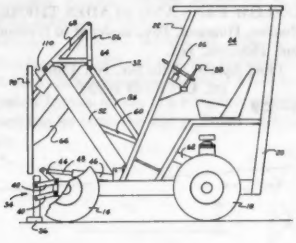
whereby said rotation of said arm causes said materials handler to rotate about said second axis.

4,345,873

MATERIAL HANDLING VEHICLE

Roger S. Wymore, 4612 F. Ave., NE., Cedar Rapids, Iowa 52402

Filed Jun. 2, 1980, Ser. No. 155,210
Int. Cl.³ B66F *9/06*
U.S. Cl. 414—714 **7 Claims**



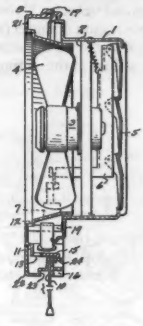
1. A material handling vehicle for moving a load a short distance, said vehicle comprising a main vehicle frame, front and rear ground-engaging wheels supported by said frame on a fixed wheel base, means for powering said vehicle, a first lifting assembly pivotally supported by said frame, said first lifting assembly including a four-bar linkage arrangement, a linkage frame pivotally connected to the outer end of said first lifting assembly, a second lifting assembly pivotally supported by said linkage frame, said second lifting assembly including a four-bar linkage arrangement, attachment means at the outer end of said second lifting assembly to provide for lifting and carrying a load at one end of the vehicle, first control means for controlling movement of said first lifting assembly, second control means for controlling movement of said second lifting assembly, said first and second lifting assemblies providing for the positioning of a load with its center of gravity between the front and rear wheels, and outrigger means moveable to and from a ground-engaging position to assist in supporting a load during the lifting of the load and positioning of the load to a carrying position.

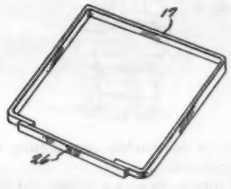
4,345,874

EXHAUST FAN WITH PROTECTIVE BAND

Kenichi Ozeki, Ichinomiya, and Takashi Fushimi, Mino, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 26, 1980, Ser. No. 124,901
Claims priority, application Japan, Jul. 24, 1979, 54-94070
Int. Cl.³ F01D *29/70*
U.S. Cl. 415—9 **16 Claims**





1. An exhaust fan comprising:

rotatable blades;

drive means for rotating said rotatable blades;

a case for mounting and surrounding at least said rotatable blades;

band means detachable disposed and surrounding said case so as to protrude therefrom for removing a coating film therewith, said film covering said case and said band means for protecting said case from dirt.

4,345,875

TURBO-MACHINES OPERATING AT THE MAXIMUM POSSIBLE EFFICIENCY

Jean F. Charpentier, 3 Rue du Pont de Madame Mille, 18190 Chateauneuf-sur-Cher, France

Filed Dec. 1, 1980, Ser. No. 211,838
Int. Cl.³ F01D *13/02*
U.S. Cl. 415—69 **1 Claim**

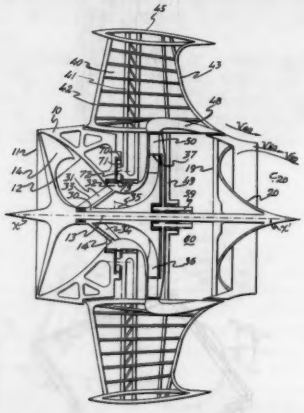
1. A compound converter of fluid energy comprising:

a. A fixed body structured for supporting several rotating units and including a fixed longitudinal central shaft surrounded by a co-axial central convergent channel having a circular frontal inlet diameter slightly smaller than the fixed body maximum diameter of the fixed body for receiving the upstream activating mass-flow of fluid and having,

b. An external axial turbine mounted free to rotate on the

fixed body and having blades that are radially extended from the outer contour of said fixed body, and receive rotational motion by the activating external mass-flow of velocity V_o passing through the actuator annulus area of said blades when rotating and with the effective energy generated by said external axial turbine being convertable to mechanical form and transmitted to:

c. An accelerator mounted free to rotate on said fixed body central shaft (a), a mechanical transmission operatively connecting the external axial turbine (b) to the accelerator, the accelerator having an inlet plane facing the outlet plane of the central converging channel (a) with its longitudinal guiding profile changing from axial to radial direction for accelerating axially and tangentially the activating mass-flow of initial velocity V_o entering the frontal inlet of the central converging channel (a) and subjecting it to the final centrifugal force of an accelerator deflector which ejects said mass-flow in the optimum direction required by



the receptive unity while transmitting to it the ultimate acceleration; and

d. A radial turbine having a cylindrical inlet and having a center support hub shaft, said radial turbine being mounted co-axially with the accelerator and free to rotate on the said central fixed shaft (a), with its cylindrical inlet facing a corresponding outlet of the accelerator (c) in order to receive through the central mass-flow ejected by same the "total effective energy retained by the turbomachine from the activating mass-flow passing through the central and annulus actuators' areas," and to convert energy to mechanical form on its own central support hub shaft prolonged beyond its bearing for connection to an output means; and

with the radial turbines' outlet facing the inlet of a rotating collector integral with the external axial turbine, structured for ensuring an efficient final phase of the mass-flow ejection.

4,345,876

ROTOR STRUCTURE FOR A ROTARY WING AIRCRAFT

Alois Schwarz, Putzbrunn; Karl-Heinz Mautz, Ottobrun, and Michael Stephan, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

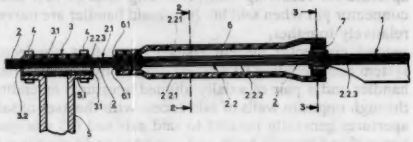
Filed Jan. 21, 1980, Ser. No. 114,236

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903524

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—134 A **8 Claims**

1. A hingeless rotor structure for rotary wing aircraft, comprising rotor head means, an even number of wing blade means forming at least one pair of wing blades, a single length of spar means operatively interconnecting the blade means of a pair, securing means rigidly securing said single length of spar means to said rotor head means, said single length of spar means comprising two members located on opposite sides of the rotor head, each spar member being located between the rotor head and the respective wing blade means, each spar member having a flexible section (2.1) having a given torsion yieldability and a torque soft zone (2.2) extending between the respective wing blade means (1) of a pair of wings and the flexible section (2.1), beam means (6) stiff against bending arranged to bridge the respective torque soft zone, bearing means (7) operatively securing said beam means at the radially outer end thereof to the respective wing blade means for permitting blade angle movements of the respective wing blade and substantially rigid means (6.1) rigidly securing the radially inner end of said beam means (6) to said spar means at a point spaced from said rotor head means so as to leave said flexible section (2.1) of the spar member between said rotor head means and said securing means (6.1), said flexible section (2.1) of the spar member being sufficiently yielding relative to bending loads to permit the blade flapping movements as well as the blade lead-lag movements and wherein said torque soft zone (2.2) of said spar means comprises a plurality of mutually separated strands (2.2.1) bridged by said beam means (6), said torque soft zone (2.2) having, due to said mutually separated strands (2.2.1), a torsion yieldability higher than said given torsion yieldability.



4,345,877

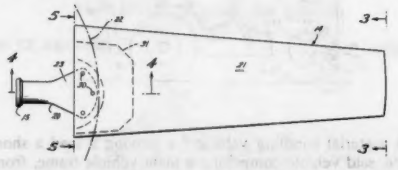
AXIAL FLOW FANS AND BLADES THEREFOR

Robert C. Monroe, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Apr. 4, 1980, Ser. No. 136,511

Int. Cl.³ F04B *29/34*

U.S. Cl. 416—239 **11 Claims**

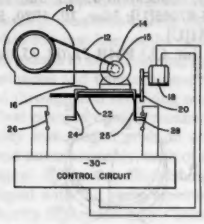


1. An axial flow fan, comprising a rotatable hub, a seal disc on one side of the hub extending outwardly from the periphery of the hub, a plurality of blades each extending radially from the hub, each blade comprising a metallic portion having a neck which is attached to the hub, and a reinforced plastic portion which has an exterior air foil cross section, and which is made of one hollow piece which decreases in width in a direction from its inner to its outer end, the outer end of the metallic portion fitting a relatively short distance into and being of substantially less width than the inner open end of the plastic portion, and fasteners securing the interfitting ends of the blade portions to one another, the outer periphery of the seal disc extending outwardly to approximately the inner ends of the plastic portion of the blades.

4,345,878
APPARATUS FOR CHANGING BELTS

Charles K. Griffin, Auburn, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,434
Int. Cl.³ F04B *49/00, 35/04*
U.S. Cl. 417—15 **3 Claims**



1. Motor position control apparatus with a manual limit switch bypass for use in changing belts comprising:

(1) demand sensing means;

(2) driven means;

(3) variable sheave driving means for driving said driven means;

(4) belt means for drivably connecting said driving and driven means;

(5) means for positioning said driving means in response to said demand sensing means;

(6) switch actuator means carried by said driving means; and

(7) control circuit means including:

(a) first limit switch means for preventing further movement of said driving means towards said driven means past a limiting position wherein said first limit switch means are opened by said switch actuator means;

(b) second limit switch means for preventing further movement of said driving means away from said driven means past a limiting position wherein said second limit switch means are opened by said switch actuator means;

(c) manually actuated bypass means for bypassing said first limit switch means; and

(d) manually actuated means for causing said driven means to move past the limiting position in which said first limit switch means are opened when said manually actuated bypass means are actuated whereby said belt means can be removed and replaced without the use of tools.

4,345,879
HYDRAULIC SWITCH FOR A PUMP

Charles W. Steiner, Brooklyn Park, Minn., assignor to Simer Pump Company, Minneapolis, Minn.

Filed Dec. 6, 1979, Ser. No. 100,896
Int. Cl.³ F04B *49/04*
U.S. Cl. 417—40 **26 Claims**

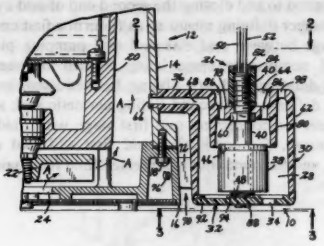
1. A hydraulic switch for controlling the operation of a pump, comprising:

means for buoyantly sensing a predetermined liquid level;

means for controlling the pump while said sensing means senses liquid at or above said liquid level;

reservoir means for holding liquid to be sensed by said sensing means;

means for communicating liquid from the discharge conduit of said pump to said reservoir means; and

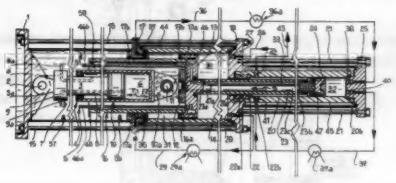


means for draining from said reservoir means said liquid flowing into said reservoir means.

4,345,880
MULTI-STAGE, RECIPROCATING, POSITIVE DISPLACEMENT COMPRESSOR

Franco Zanarini, Castel Maggiore, Italy, assignor to Safe S.r.l., Bologna, Italy

Filed Jun. 11, 1980, Ser. No. 158,523
Claims priority, application Italy, Aug. 28, 1979, 4915/79[U]
Int. Cl.³ F04B *3/00, 25/00, 35/00*
U.S. Cl. 417—264 **10 Claims**



1. A multi-stage reciprocating, positive displacement compressor having first and second ends and comprising:

a support structure forming the first end of said compressor;

a hydraulic jack having an axially-extending rod with a first end secured to said support structure and a second end extending towards said second end of said compressor, said rod forming a piston, and a cylinder encompassing the piston, the piston dividing the interior of the cylinder into first and second expansion chambers;

means for feeding fluid under pressure into said first and said second expansion chambers to thereby reciprocate said cylinder with respect to said rod;

a pumping piston coaxial with said cylinder and secured to an end of said cylinder closest to the second end of the compressor;

chamber defining means for defining a cylindrical chamber secured to said support structure, said cylindrical chamber being coaxial with and encompassing said pumping piston, said chamber defining means having a first end extending towards said first end of said compressor and a second end extending towards said second end of said compressor;

means for defining a first sliding hermetic seal between an interior surface of said cylindrical chamber and a peripheral surface of said pumping piston;

a cylindrical tubular liner coaxial with and inwardly spaced from said chamber defining means, a first end of said liner extending towards the first end of said compressor and a second end of said liner being secured to said pumping piston;

a guide ring secured to and extending inwardly from said first end of said cylindrical chamber defining means;

means for defining a second sliding hermetic seal between an interior surface of said guide ring and an exterior surface of said tubular liner;

a disk secured to and closing the second end of said cylindrical chamber defining means so as to form a first compressor stage between said disk and said pumping piston, a second compressor stage being formed between said means defining said first sliding hermetic seal and said means defining said second sliding hermetic seal; and

pipe means for connecting said first stage with fluid to be compressed, for connecting said first and said second stages, and for removing compressed fluid from said compressor.

4,345,881

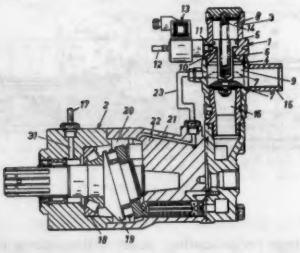
CLOSE-OFF VALVE FOR SUCTION PIPES IN HYDRAULIC PUMPS

Ralf K. E. Petersson, deceased, late of Hudiksvall, Sweden, and by Stephan Vejdemo, executor, Huddinge, Sweden, assignors to Sundins Fabriker AB, Hudiksvall, Sweden

Filed Jan. 31, 1980, Ser. No. 117,346

Int. Cl.³ F04B *1/18, 39/10*

U.S. Cl. 417—270 **3 Claims**



1. An improved close-off valve for suction pipes between a reservoir and a hydraulic pump, said pump being of the kind comprising a hydraulic piston system, a main passageway adapted to selectively communicate with said reservoir, a tilting disc for operating said hydraulic piston system for generating a flow of a hydraulic fluid from the reservoir through the said main passageway to said pump, a thrust bearing supporting said tilting disc, and a bypass passageway provided in the pump housing and passing across said tilting disc and said thrust bearing to allow passage through of a small amount of oil, said small amount of oil being sufficient to lubricate and cool the pump, said close-off valve comprising a valve housing, a spring-loaded piston movably mounted in said valve housing and operatively connected to a rod, a valve disc supported by said rod, a solenoid valve controlling the movement of said valve disc, said valve disc arranged to be moved into abutment against a valve seat for the purpose of shutting off the connection of said reservoir to said main passageway of the pump, the improvement comprising a cavity in said valve housing between said reservoir and said valve seat, said cavity being in continuous communication with the reservoir and with said bypass passageway regardless of the position of said valve disc for allowing oil to flow from the reservoir around said thrust bearing and said tilting disc and further through said bypass passageway to lubricate said thrust bearing of the pump and said tilting disc to cool the pump even when said valve disc is in the closed position.

4,345,882

HERMETIC MOTOR COMPRESSOR

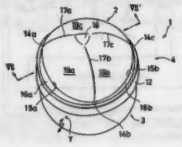
Fumitoshi Saito, Yawata; Sotomitsu Maeda, Kadoma, and Toshio Uetsuji, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited and Matsushita Reiki Company, Limited, both of Osaka, Japan

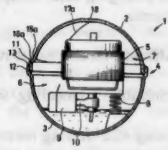
Filed Jul. 11, 1980, Ser. No. 168,178

Claims priority, application Japan, Jul. 13, 1979, 54-89549; Jul. 13, 1979, 54-97065[U]; Mar. 10, 1980, 55-31450[U]; Mar. 10, 1980, 55-31451[U]

Int. Cl.³ F04B *21/00, 35/04*

U.S. Cl. 417—312 **15 Claims**





1. A hermetic motor compressor comprising:

(a) a motor-compressor unit; and

(b) a casing for containing said motor-compressor unit, said casing having a dome-like upper casing and a dome-like lower casing, each of said upper and lower casings having an engagement portion for engaging with each other, and an apex portion at the top of the dome thereof, at least one of said upper and lower casings having:

at least three corner portions in the vicinity of said engagement portion thereof;

at least three crest lines respectively extending from said corner portions toward said apex portion;

said casing having at least three crescent-shaped planes, each plane being placed between a pair of said corner portions, each of said crescent-shaped planes having a convexly curved side placed along a section of said engagement portion, and a concavely curved side; and

at least three curved surfaces connecting two of said crest lines and said concavely curved side of respective crescent-shaped planes.

4,345,883

HIGH PRESSURE PUMPING APPARATUS FOR SEMI-FLUID MATERIAL

Robert E. Westerlund, 10904 N. Westview 41W, Mequon, Wis. 53092, and Wayne L. Read, 4913 Hillside Rd., West Bend, Wis. 53095

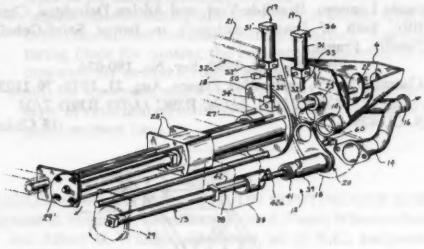
Filed Jun. 11, 1979, Ser. No. 47,301

Int. Cl.³ F04B *7/04, 49/00*

U.S. Cl. 417—317 **6 Claims**

1. A pumping apparatus for establishing a constant and uniform pressurized discharge flow of semi-fluid material through a flow system adapted to be connected to such apparatus, comprising a supply means containing a supply of semi-fluid material and having discharge means for delivery of the semi-fluid material therefrom, a plurality of receiving means located in predetermined spaced relation to said discharge means for receiving said semi-fluid material and transferring said material to a remote location, a plurality of pump assemblies movably mounted with respect to said discharge means

and said receiving means to a charging position and a discharge position for selective charging and discharging with material, control means coupled to actuate said pump assemblies and operable to charge the pump assemblies substantially more rapidly then to discharge the pump assembly, said control means including positioning means alternately positioning the pump assemblies in said two positions and including a period of a simultaneous discharge positions during each positioning of the pump assemblies for simultaneously establishing pressurized flow from said pumps to said receiving means and thereby establishing a continuous and uninterrupted movement of the semi-fluid material through said receiving means, said control means including first position control means for actuating the first pump assembly and second position control means for actuating the second pump assembly, each of said pump assemblies including signal means for establishing unique signals including a first signal with the pump assembly fully charged, a second signal shortly before the pump assembly is fully discharged and a third signal when the pump assembly is fully discharged, a fourth signal in response to positioning of the pump assembly in the charging position and a fifth signal in



response to positioning of the pump assembly in the discharging position, and circuit means connecting said signal means into said first and second control means to cyclically actuate said pump assemblies including a pumping cycle in which the first pump assembly is charging and the second pump assembly is discharging, said charging being at a substantially faster rate than said discharging and in sequencing including a condition in which said first pump assembly is fully charged and in said discharge position prior to said second pump assembly and actuating said corresponding signal means to establish said second signal and said second pump assembly actuates said second signal means to establish said second signal means to actuate the fi st pump assembly to discharge simultaneously with the second pump assembly and said second pump assembly actuating the second signal means to establish said third signal and actuating the positioning means to place the second pump assembly in the charging position for charging of said second pump assembly and initiating a second cycle with the first and second pump assemblies reversed in the identical sequence to the first cycle, said first and second control means continuously establishing said first and second cycles to maintain a constant discharge.

4,345,884

PUMP DRIVE

Michael A. Longiny, Fountain Valley; Dimitar Kalchev, Montebello, and Thomas K. Zinn, Chino, all of Calif., assignors to Peerless Pump Division, Indian Head Inc., Montebello, Calif.

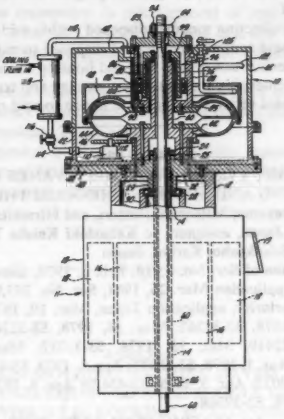
Filed Jan. 28, 1980, Ser. No. 115,941
Int. Cl.³ F04B 49/00
U.S. Cl. 417—359 **17 Claims**

2. A mechanism for driving a pump comprising:

(a) a hollow shaft motor;

(b) a rotatable output shaft having first and second ends and capable of being mechanically coupled to the pump at its second end, a portion of the output shaft between the first and second ends being within the hollow shaft of the motor;

(c) a variable speed transmission unit adjacent the motor and mechanically coupled to the hollow shaft and the output shaft for transmitting power from the motor to the output shaft for rotation of the output shaft at a rate proportional to the rate of rotation of the hollow shaft; and



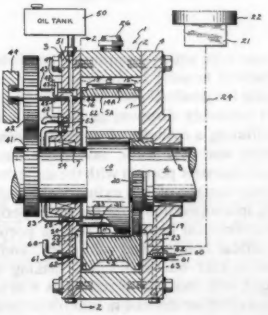
(d) means for adjusting the position of the output shaft relative to the motor, the adjusting means being located on the opposite side of the variable speed transmission unit than the motor, wherein the output shaft is not directly in contact with any bearings.

4,345,885

LUBRICATION SYSTEM FOR ROTARY-TROCHOIDAL ENGINES

Eugene D. Turner, West Bend, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.

Filed Mar. 3, 1980, Ser. No. 126,323
Int. Cl.³ F01C 21/04
U.S. Cl. 418—90 **9 Claims**



1. In a rotary-trochoidal engine having (a) a housing formed by a rotor housing defining a trochoidal chamber and a pair of opposed end housings joined thereto, (b) a crankshaft journaled in the end housings and having an eccentric positioned in the trochoidal chamber, and (c) a rotor supported on a rotor bearing carried on a surface of the eccentric,

a lubrication system for supplying lubricating oil for the rotor bearing comprising, in combination:

(1) a first oil passage extending through a first of said end housings,

(2) a second oil passage in the eccentric, one end of said second passage disposed in communication with the surface of the eccentric on which the rotor bearing is carried and the opposite end of said second passage disposed to register with said first passage as the eccentric rotates within the housing,

(3) means for supplying lubricating oil to said first passage, and

(4) a collecting member disposed within said opposite end of said second passage and disposed to ride against the inner surface of said first end housing to thereby collect oil emerging from said first passage and transfer said oil to said second passage and hence to said rotor bearing.

4,345,886

ROTARY COMPRESSOR WITH VANES IN THE HOUSING AND SUCTION THROUGH THE ROTOR

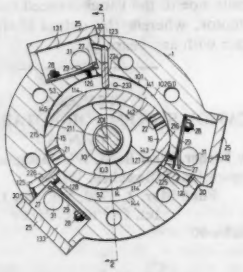
Shozo Nakayama; Mitsuhiro Hattori, and Hiromitsu Ono, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 8,918, Feb. 5, 1979, abandoned. This application Mar. 26, 1981, Ser. No. 247,953

Claims priority, application Japan, Mar. 10, 1978, 53-27973; Mar. 14, 1978, 53-32261; Mar. 14, 1978, 53-32262; Mar. 14, 1978, 53-32419; Mar. 15, 1978, 53-33212; Mar. 15, 1978, 53-33213; Apr. 1, 1978, 53-38391; Apr. 1, 1978, 53-42720; Apr. 3, 1978, 53-39023; Apr. 3, 1978, 53-43429; Apr. 4, 1978, 53-39367; Apr. 4, 1978, 53-39368

Int. Cl.[3] **F04C** *18/00, 27/00, 29/02*

U.S. Cl. 418—100 **15 Claims**



1. A vane type rotary compressor comprising:

a cylindrical housing having front and rear side plates for closing longitudinal ends of said housing;

a rotor rotatably disposed in said cylindrical housing for constituting a cylinder chamber between said cylindrical housing and said rotor, said rotor having at least one longer-diameter portion with the same curvature as that of an inner surface of said cylindrical housing which constitutes, in cooperation with the inner peripheral surface of said cylindrical housing, a sealing portion between said cylindrical housing and said rotor, said rotor extending between said side plates and making gas tight sliding contact with said side plates when it is rotated;

a suction chamber defined in said rotor for sucking a fluid to be compressed from the outside of said housing, said suction chamber extending in the inside of said rotor from the one side plate to the other side plate of said housing such that an inner surface of said rotor is directly in contact with said side plates for providing a gas tight seal and lubrication therebetween by the fluid sucked into the suction chamber;

a plurality of vanes disposed in said housing and with their inner ends engaging the outer peripheral surface of said rotor with sliding contact, so as to divide said cylinder chamber into at least two working chambers, the number of said vanes being one more than the number of said longer-diameter portions of said rotor;

at least one suction port formed through the wall of said rotor for communicating between said suction chamber and one of said working chambers, said suction port being located such that, when the volume of one of said working chambers has been expanded to the maximum for compression of the sucked fluid as a result of the rotation of said rotor by power applied from outside, said suction port is positioned immediately beyond that vane that defines the leading edge of the respective working chamber and said suction port is immediately behind the respective longer-diameter portion of the rotor; and

delivery ports located in said housing to deliver fluid compressed in said working chambers to the outside of said housing, the number of said delivery ports being as many as that of the working chambers.

4,345,887

DEVICE FOR THE POURING OF PLASTER

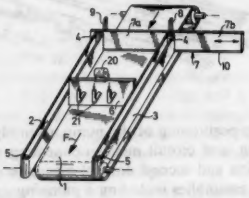
Jacques Lanneau, Breuil-le-Vert, and Adrien Delcoigne, Chantilly, both of France, assignors to Isover Saint-Gobain, Neuilly, France

Filed Aug. 21, 1980, Ser. No. 180,036

Claims priority, application France, Aug. 21, 1979, 79 21038

Int. Cl.[3] **B28B** *21/56, 21/94;* **B29C** *13/00;* **B29D** *7/02*

U.S. Cl. 425—115 **18 Claims**



1. Apparatus for casting a plaster composition onto a moving base including

a bottomless reservoir disposed above said moving base,

said apparatus having a slit between said base and a front wall of said reservoir.

a movable rear wall of said reservoir being disposed with a surface thereof substantially vertical to said base and said rear wall being formed of but a single member having a larger surface at least twice that of an end of said reservoir, and

said member being mounted such that said surface can be traversed across the width of said reservoir.

4,345,888

APPARATUS FOR PRODUCING PREFABRICATED MODULAR BUILDING PANELS

James C. Brunemann, R.R. 5, P.O. Box 31, Brookville, Ind. 47012

Filed Oct. 27, 1980, Ser. No. 201,219

Int. Cl.[3] **B28B** *7/22, 21/96*

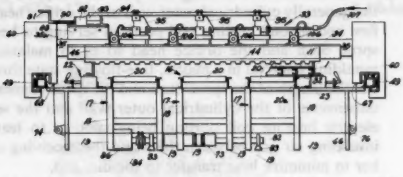
U.S. Cl. 425—117 **31 Claims**

1. Apparatus for applying an exterior layer of cementitous material to a partially assembled prefabricated modular building panel of the type having a rigid framework composed of a plurality of rigidly interconnected stud members and a support base secured to the framework having an outer surface configured to retain the cementitous material, said apparatus comprising:

a generally-horizontal planar bed for supporting the partially assembled panel in a horizontal position with the outer surface of the support base facing upwardly;

screed means overlying said bed for spreading cementitous

material over the outer surface of the panel support base, said screed means comprising an elongated screed extending transversely across said bed and movable horizontally along the longitudinal axis of the bed, and texturing means secured to said screed and vertically positioned to contact the exterior layer of cementitous material applied to the outer surface of the support layer, said texturing means comprising an elongated texturing blade attached to the lower end of said screed, said texturing blade configured



to produce a desired surface texture in the cementitous layer as the screed traverses the bed;

an angled plate extending upwardly and forwardly from the front cementitous material contacting surface of said texturing blade for causing the cementitous material to roll downwardly as said screed traverses the bed; and

means for traversing said screed over said bed to spread the layer of cementitous material over the outer surface of the panel support base.

4,345,889

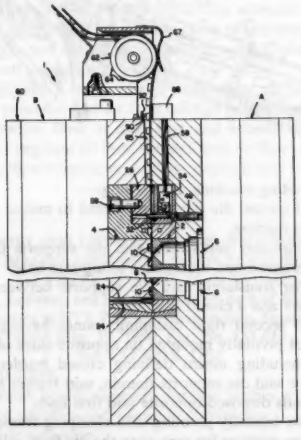
MOLDING PLASTIC BODIES ON CONTINUOUS STRIP

Ronald D. Sizemore, Germanton; John J. Tucci, Winston-Salem, and Albert D. Willette, Pfafftown, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 81,607, Oct. 3, 1979, Pat. No. 4,309,370. This application May 26, 1981, Ser. No. 267,099

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—122 **7 Claims**



1. Apparatus for molding a series of products along a continuous strip, comprising:

a first mold half and a second mold half constructed for closed together cooperation during a molding cycle,

a pair of molding dies mounted respectively on said first mold half, and in closed together cooperation during a molding cycle to mold a composite product consisting of a series of molded bodies interconnected one to the other and provided with at least one molded strip segment,

first means for closing together said dies and for separating said dies to provide a space therebetween,

second means on one said dies for ejecting said composite product outwardly of one said die,

drive means for withdrawing all but a remainder portion of said composite product from said space between said dies,

third means for aligning said remainder portion in desired position between said dies prior to closing together said dies in a repeated molding operation,

fourth means responsive to misalignment of said remainder portion between said dies for disabling said first means and preventing closure together of said dies for a repeated molding cycle,

said drive means constructed for providing slack in said composite product during closure together of said dies during a repeated molding cycle, and

during a repeated molding cycle, said dies constructed for molding an additional composite product joined integrally to said remainder portion.

4,345,890

INJECTION MOLDING MACHINE HAVING MOLD LOCKING UNIT EQUIPPED WITH TOGGLE DRIVE AND HYDRAULIC LOCKING MECHANISM

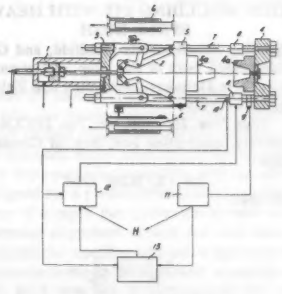
Peter Hemmi, Männedorf, and Richard Schrepfer, Näfels, both of Switzerland, assignors to Netstal-Maschinen AG, Switzerland

Filed Jun. 6, 1980, Ser. No. 157,277

Claims priority, application Switzerland, Jun. 11, 1979, 5467/79

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—143 **7 Claims**



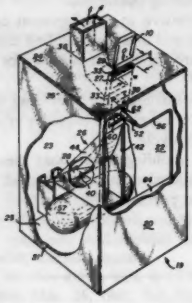
1. An injection mold for conducting molding operations, with locking device comprising a fixed backing plate, a fixed mold part plate, at least one thermally expandible and contractible tie rod connected between said fixed backing plate and said fixed mold part plate, a movable mold part plate, drive and locking means connected between said fixed backing plate and said movable mold part plate for moving said movable mold part plate toward said fixed mold part plate and locking said movable mold part plate in a molding position with respect to said fixed mold part plate, and thermal force control means associated with said tie rod for continuously sensing and for regulating the temperature thereof during molding operations to selectively change the length thereof between said fixed backing plate and said fixed mold part plate and thus the force between said fixed and movable mold part plate.

4,345,891

APPARATUS AND METHOD FOR FUZZ REMOVAL FROM EDGES OF SHEET MATERIAL

Lawrence G. Martinelli, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed May 28, 1980, Ser. No. 153,866
Int. Cl.³ B29C *17/08, 17/12*
U.S. Cl. 425—289 11 Claims



1. Apparatus for removing fuzz from the edges of sheets of material which is decomposible by heat, the apparatus comprising:

an elongated inclined chute having an opening about one end for receiving a sheet of material from which fuzz is to be removed, having an aperture intermediate its terminal ends and penetrating laterally through the chute; and

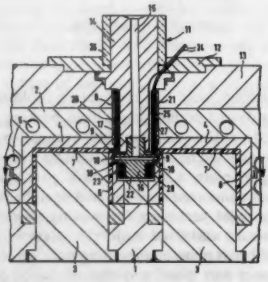
a heated gas flow means positioned adjacent to said aperture for creating a heated gaseous flow through said aperture, whereby the fuzz from the edges of the moving sheet which pass within the confines of the aperture are decomposed.

4,345,892

INJECTION MOULDING DIE WITH HEAVY-DUTY SPRUE BUSH

Wolfgang Schulte, Schalksmühle-Heedfeld, and Giacinto Castiglia, Lüdenscheid, both of Fed. Rep. of Germany, assignors to Firma Jetform Heisskanalnormalien und Zubehor GmbH, Fed. Rep. of Germany

Filed Nov. 25, 1980, Ser. No. 210,226
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1980, 3002264
Int. Cl.³ B29F *1/08*
U.S. Cl. 425—548 8 Claims



1. In an injection moulding die for moulding thermoplastic material, the die having a heavy-duty sprue bush of higher temperature than the die for a spruing through tunnel gating to at least one mould chamber, the heavy-duty sprue bush being: oriented generally perpendicularly to the jointing plane of the die; fixedly located within a receiving chamber in the die; and heated by a first electric heater portion coiled around it, the improvements comprising:

(a) an orifice head attached to a front end of the sprue bush and received in the receiving chamber, the orifice head having a generally cylindrical outer wall;

(b) means in the orifice head defining sprue runners, the axis of each runner extending generally parallel to, but displaced from the jointing plane of the die;

(c) a second electric heating coil portion wrapped around the generally cylindrical outer wall of the orifice head, the first and second heating coil portions serving to heat the sprue bush and the orifice head so as to maintain the moulding material in a plastic, free-flowing state throughout the length of the sprue bush and the sprue runners, the dimensions of the cylindrical outer wall and the second electric heating coil portion being such as to leave an insulating air gap between them and the receiving chamber to minimize heat transfer to the die; and,

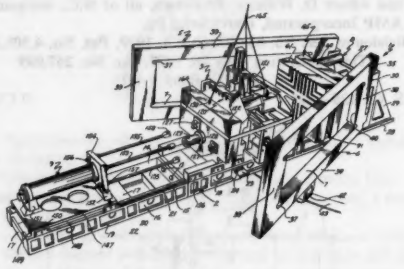
(d) means defining an injection opening through a side wall of each of the moulding chambers tightly abuting said sprue runners, the axis of each injection opening extending generally parallel to the jointing plane of the die, but displaced therefrom.

4,345,893

MOLDING MACHINE

Edgar D. Prince, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Oct. 20, 1980, Ser. No. 199,066
Int. Cl.³ B29F *1/00;* B29C *1/00*
U.S. Cl. 425—595 29 Claims



1. A molding machine, comprising:

first and second die supports adapted to mount mating die halves thereon;

a base movably supporting said die supports thereon for convergence and divergence along said base;

means for translating said die supports between an open position and a closed position;

first and second rigid clamping frames having first ends thereof pivotally mounted on opposite sides of said base, and including means defining closed borders sized to receive said die supports therein; said frames having second ends disposed opposite said first ends;

means for laterally pivoting said clamping frames between an open position for removing the die from said base, and a closed position wherein the closed borders of said clamping frames are received over and surround said die supports;

means for retaining the second ends of said clamping frames in the closed position during molding; and

means extendable between one of the first and second ends of said clamping frames and an adjacent one of said die supports for positively blocking said die supports in the closed position within said clamping frames, whereby

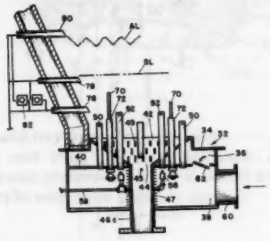
separation forces developed during die injection are resisted by said clamping frames.

4,345,894

LIGHT FUEL START-UP FLUIDIZED BED COMBUSTOR

Willard P. Smith, and Bruce R. Hutchinson, both of Spring Lake, Mich., assignors to Stone-Platt Fluidfire Limited, Brierly Hill, England

Filed Oct. 20, 1980, Ser. No. 198,918
Int. Cl.³ F27B *15/14*
U.S. Cl. 431—170 **5 Claims**



2. A fluidized bed combustor comprising:

a combustion chamber;

a distributor plate assembly at the bottom of said combustion chamber;

said assembly including a housing forming a first air plenum and a second air plenum; a surface in the top of said housing, having air flow openings in said surface from said first plenum to said combustion chamber; air flow riser tubes in addition to said air flow openings, said riser tubes projecting up from said second plenum to a position elevated above said surface, having air inlets adjacent the bottom of said riser tubes and air outlets adjacent the top thereof; said riser tubes comprising a first set of riser tubes and a second set of riser tubes; fuel nozzles arranged for injection of light liquid fuel into the risers of said second set for elevation and discharge of the fuel with air flow to said combustion chamber;

forced air supply means to said housing for air flow thereto under pressure; and air flow control means for regulating the relative flow at said first and second plenums to thereby regulate air flow through said air flow openings in said surface relative to air flow through said riser tubes.

4,345,895

PHOTOFLASH DEVICE HAVING DIE-STAMPED CIRCUIT BOARD ASSEMBLY WITH FLEXURE MEANS TO PREVENT SWITCH CUTTING

Randall H. LeFever, and Boyd G. Brower, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 19, 1980, Ser. No. 131,610
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—359 **24 Claims**

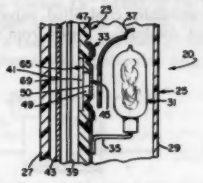
1. A circuit board assembly for use within a photoflash device, said circuit board assembly comprising:

a dielectric substrate;

a switching element positioned on said dielectric substrate and having a portion thereof pressed within said dielectric substrate;

an electrically conductive member pressed within said dielectric substrate and having at least a part thereof located atop said pressed portion of said switching element and in electrical contact therewith; and

flexure means located within said substrate or forming a part thereof for permitting said substrate to flex during pressing of said portion of said switching element and said conductive member within said substrate sufficiently to



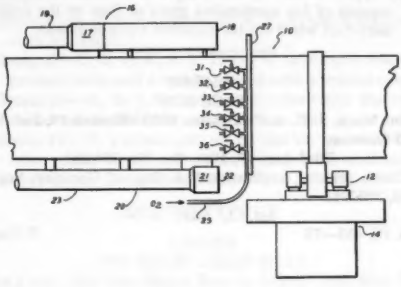
prevent severing of said switching element during said pressing.

4,345,896

METHODS AND APPARATUS FOR CALCINING CARBONACEOUS MATERIAL

Randolph Abernathy, Jr., South Orange, and Douglas M. Rowe, Somerset, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Apr. 29, 1981, Ser. No. 258,826
Int. Cl.³ F27D *7/02*; F27B *9/04, 7/00*
U.S. Cl. 432—19 **11 Claims**



1. Apparatus for calcining carbonaceous material comprising a rotary kiln; fan means mounted on said kiln for introducing air through an inlet thereof and into the interior of said kiln; valve means disposed about a portion of the circumference of said kiln such that upon kiln revolution, said fan inlet and valve means are aligned for a predetermined segment of kiln revolution; a source of oxygen gas connected to said valve means; means for sensing alignment of said fan inlet and said valve means; and means for opening said valve means in response to said sensing means sensing said alignment to supply oxygen gas into said fan inlet whereby air introduced into said kiln is enriched in oxygen.

4,345,897

RECIRCULATING SYSTEM FOR GAS-FIRED FURNACE

C. Robert Stanton, 1316 Edwardsville Rd., Granite City, Ill. 62040

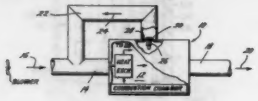
Filed Apr. 21, 1980, Ser. No. 142,079
Int. Cl.³ F24H *1/00*; F24B *7/00*; F16K *15/00*
U.S. Cl. 432—72 **12 Claims**

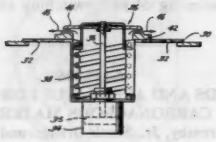
1. Combustion gas recirculating system for a gas-fired furnace of the type which includes a plenum with a cold air inlet duct and a warm air exhaust duct, a combustion chamber where gas is burned to form hot combustion gases, a heat exchanger in the plenum for receiving the hot combustion gases and including a surface configuration past which air can flow and be heated, an outlet in the heat exchanger for the hot

combustion gases, and a blower for moving air through the plenum and past the heat exchanger, the invention comprising:

(a) a recirculation duct connecting the combustion gas outlet with the cold air inlet duct;

(b) a thermostatically controlled valve for regulating the flow of hot combustion gases from the combustion gas





outlet to the cold air inlet duct by opening when the hot combustion gases reach a predetermined temperature and closing when the hot combustion gases are below said predetermined temperature; and

(c) bypass means for allowing a pedetermined minimum amount of hot combustion gases to flow to the cold air inlet duct when the thermostatic valve is closed.

4,345,898

FACE BOW

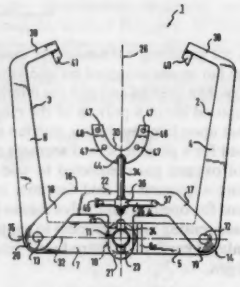
Heinz Mack, Südl. Auffahrtsallee, 8000 München 19, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,232

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032913

Int. Cl.³ A61C *19/04*

U.S. Cl. 433—73 **7 Claims**



1. A face bow consisting essentially of two L-shaped side arms which are connected by pivot bearings to a base plate at two oppositely located peripheral pivot points for scissors-like movement, and which can be locked in the overlapping region of the ends of the transverse portions of the L-shaped side arms, wherein

(a) the pivot bearings (12,13) are disposed in the respective L-bends (14,15) of the L-shaped side arms (2,3), and

(b) in the middle between the pivot bearings (12,13) on which the base plate is mounted and spaced inwardly thereof, the base plate (16) is provided with a slot (23) in a portion of the plate which extends rearwardly of the remainder thereof whose longitudinal edges (24,25) extend parallel to the longitudinal axis (26) of the face bow (1) and through which projects the locking means (11), passing rotatably but non-slidably through the free ends (8,9) of the transverse portions (5,7) in the overlapping region.

4,345,899

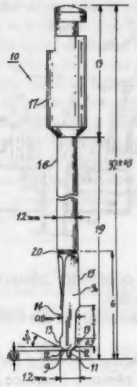
DENTAL TWIST DRILL

David G. Vlock, 2 E. 65th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 56,760, Jul. 12, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,777

Int. Cl.³ A61C *3/02*

U.S. Cl. 433—165 **8 Claims**



1. A longitudinal dental twist drill comprising a plurality of cutting blades extending at an angle to the principal axis of the drill; a plurality of bearing surfaces supporting said cutting blades; said bearing surfaces extending helically along the drill; the outer bearing surfaces extending parallel to the main axis of the drill and defining, when rotated, a cylindrical surface; a plurality of flutes separating said bearing surfaces; an additional bearing section extending along the main axis of the drill; and a recess between said additional bearing section and said first mentioned bearing surface, serving as a pocket for the reception of debris transferred from the cutting members by the flutes along the axis of said drill; whereby a parallel-sided cylindrical deep hole is formed in a tooth when drilled with said dental twist drill.

4,345,900

DENTURE MEANS AND METHOD

Harry S. Katz, 785 Pleasant Valley Way, West Orange, N.J. 07052, and Sidney Schneider, 576 Sussex Ave., Morristown, N.J. 07960

Continuation of Ser. No. 398,936, Sep. 20, 1973, abandoned, and a continuation-in-part of Ser. No. 241,706, Apr. 6, 1972, abandoned. This application Apr. 30, 1975, Ser. No. 573,324

Int. Cl.² A61C *13/22*

U.S. Cl. 433—171 **76 Claims**

73. A method of forming an artificial denture for the mouth of a dental patient employing a tray having a gum-receiving portion with a U-shaped continuous slot formed therein, and a preformed unitary structure comprising an abbreviated basic tray, the bottom portion of which is removed forming a slot in said basic tray, thereby exposing the bottoms of the false teeth, the method comprising:

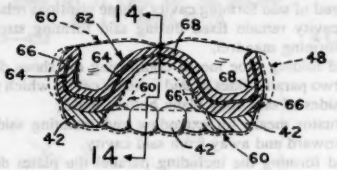
placing a deformable sheet as a spacer over said tray, a applying pressure to said tray having said spacer therein to conform said tray to the gums of a patient with the spacer between the surfaces of said tray and of said gums,

removing said tray from said gums,

applying a suitable amount of dental acrylic resin to said tray,

placing said tray in contact with said gums with said dental acrylic resin adjacent said gum surfaces,

simultaneously forcing said tray against said gums while allowing said dental acrylic resin to harden,



removing said tray from said gums, and

separating said tray from said hardened acrylic resin whereby said preformed unitary structure and said hardened acrylic resin form a unitary denture.

4,345,901

DENTAL PROSTHESIS CONNECTING APPARATUS

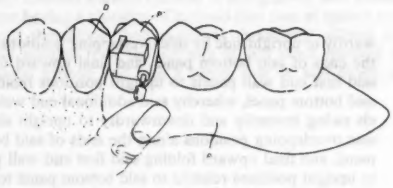
Mario Romagnoli, Milan, Italy, assignor to Metaux Precieux S.A., Neuchatel, Switzerland

Filed Apr. 30, 1980, Ser. No. 145,338

Claims priority, application Italy, May 9, 1979, 22485 A/79

Int. Cl.³ A61C *13/22*

U.S. Cl. 433—172 **7 Claims**



1. Connecting apparatus for removable dental prosthesis, of the type having a male part, a female part, and a device for joining said male part and said female part, wherein the improvement comprises:

said male part being of substantially frustoconical shape;

said female part being of substantially frustoconical shape; and

said device for joining comprising means for securing said female member to said male member and preventing relative movement therebetween, said means for securing comprising a cylindrical sliding member incorporated in said female part and movable transversely with respect to a longitudinal axis of said female part, said male member having a substantially semi-cylindrical, laterally outwardly open, transverse groove, the surface of which is generated about a substantially straight line, for receiving said sliding member whereby said male part and said female part are interlocked and said sliding member and said transverse groove are coaxial when said sliding member is in place.

4,345,902

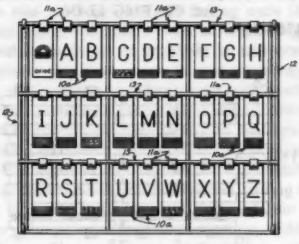
SIMPLIFIED PHONICS IN THE SEQUENTIAL STEPS TO READING

Jean V. Hengel, One Vernon La., Malvern, Pa. 19355

Continuation-in-part of Ser. No. 153,261, May 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 753,263, Dec. 22, 1976, abandoned. This application Aug. 31, 1981, Ser. No. 297,635

Int. Cl.³ G09B *1/12*

U.S. Cl. 434—170 **5 Claims**



1. A color coded device employing three different colors for teaching phonics which comprises a display of letters of the English alphabet wherein said display is on cards grouped as follows:

Group I—B, D, F, J, L, M, N, Q, R, V, X, and Z are coded with one color;

Group II—C, G, H, K, P, S, T, and W have more than one pronunciation and are color coded with a second color;

Group III—A, E, I, O, and U are vowels and are color coded with a third color and

Group IV—Y, a consonant, which can act as a vowel, is color coded with two (2) colors because it has attributes of both Group II and Group III.

4,345,903

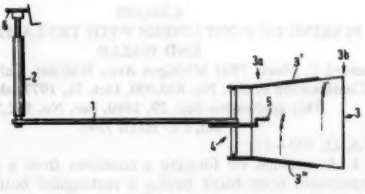
FIN PROPULSION BOAT

Otto Laser, Zum Homberger Born 6, D-3546 Vöhl-Asel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 109,236, Jan. 3, 1980, abandoned, which is a continuation of Ser. No. 873,206, Jan. 30, 1978, abandoned. This application May 27, 1980, Ser. No. 152,995

Int. Cl.³ B63H *25/06*

U.S. Cl. 440—14 **11 Claims**



1. In a boat incorporating a tread system with pedals for applying foot power to a cross bar rigidly fastened to a pivot which extends through the boat bottom and carries, at its lower end, a substantially horizontal swing arm to the free end of which a vertical fin is mounted for limited lateral movement with respect to the swing arm, and further incorporating a front steering mechanism including a pivotable forward fin near the bow of the boat, the improvement comprising an aft stabilizing fin rigidly attached to the boat bottom near the stern

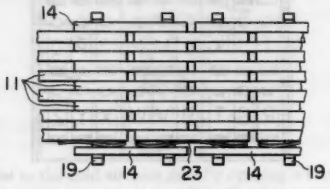
thereof, said vertical fin being arranged between said forward and aft fins.

4,345,904

CHAIN DRIVE ASSEMBLY

Akio Numazawa, Nagoya; Yutaka Taga, and Masayoshi Funato, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 44,186, May 31, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,319
Claims priority, application Japan, Apr. 9, 1979, 54-41980
Int. Cl.³ F16G *13/04*
U.S. Cl. 474—215 **16 Claims**



1. In a silent chain for cooperative engagement with sprockets on a sprocket wheel, said chain including a plurality of plates the top and side edges of which are substantially identical in shape and dimension, said plates being arranged in transversely adjacent groups and said groups being longitudinally rotatably coupled by transverse pins forming said chain, the improvement comprising:

a curved leaf spring having top and side edges substantially conforming in shape to the top and side edges of said plates, said leaf spring having a pair of longitudinally adjacent holes and being secured by a longitudinally adjacent pair of said pins received in said holes for compression between transversely adjacent plates, said leaf spring being curved to provide a longitudinally central bow portion between said pins and being disposed coincident with at least one of said transversely adjacent plates so that said bow portion is in biasing contact with a corresponding longitudinally central portion of said coincident transversely adjacent plate, said leaf spring biasing said plates together in a direction axial of said pins, the length of said leaf spring on a pitch circle of said sprocket wheel being smaller than that of said plates and the diameter of said holes being greater than said pins to preclude contact by said leaf springs with said sprockets when said groups of plates engage said sprockets.

4,345,905

MAKING OF CONTAINERS WITH TRI-LAMINATED END WALLS

Lenard E. Moen, 7914 Michigan Ave., Whittier, Calif. 90602

Continuation of Ser. No. 846,900, Oct. 31, 1977, abandoned. This application Sep. 29, 1980, Ser. No. 191,529
Int. Cl.³ B31B *1/46*
U.S. Cl. 493—171 **5 Claims**

1. A machine for forming a container from a preformed paperboard body blank having a rectangular bottom panel, side wall panels along and substantially co-extensive with the two sides of said bottom panel, first end wall panels along and substantially co-extensive with the two ends of said bottom panels, and two pairs of additional end wall panels extending endwise of said side panels from the ends of the latter panels and each having a length approximating the width of said bottom panel, said machine comprising:

a forming die defining a forming cavity of substantially the same rectangular cross-section as said body blank bottom panel,

a substantially rectangular forming mandrel movable longitudinally through a forming stroke into and a return stroke from said cavity through said one end of the cavity,

said forming die being adapted to receive said body blank in an initial forming position, wherein said bottom panel of the blank overlies said one end of said cavity, whereby movement of said mandrel through said forming stroke forces said body blank into said cavity bottom panel first,

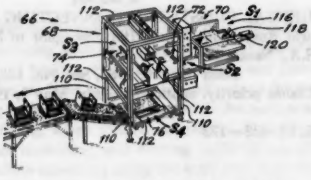
said forming die including folding shoe means about said one end of said forming cavity whose positions relative to said cavity remain fixed during said forming stroke of said forming mandrel,

said folding shoe means comprising die shoes defining the two parallel sides of said forming cavity which parallel the sides of said body blank bottom panel,

actuator means for extending and retacting said die shoes toward and away from said cavity,

said forming die including parallel die plates defining the two remaining sides of said cavity,

said folding shoe means being disposed to engage said end wall panels of said body blank in said initial forming position of the bank in such manner that during movement of said blank into said cavity by said mandrel, said folding shoe means effect upward folding of said additional end wall panels relative to said side wall panels in a sequence of one pair after the other pair of said additional end panels, followed by simultaneous continued folding of said additional end wall panels relative to said side wall panels and concurrent upward folding of said side wall panels to upright positions relative to said bottom panel, whereby said additional end wall panels swing inwardly and downwardly to upright side by side overlapping positions along the ends of said bottom panel, and final upward folding said first end wall panels to upright positions relative to said bottom panel, whereby said additional end wall panels swing inwardly and downwardly to upright side by side overlapping positions along the ends of said bottom panel, and final upward folding said first end wall panels to upright positions relative to said bottom panel to form a container configuration wherein said end wall panels were disposed in upright side by side contacting relation along the ends of said bottom panel extending the full width of said bottom panel to form full width three ply laminar end walls of said container configuration,



means for operating said actuator means to extend said die shoes in timed relation to movement of said forming mandrel for pressing said body blank side wall panels against the opposing side faces of said mandrel,

said mandrel side faces converging upwardly in such a way that pressing of said body blank side walls against said mandrel faces by extension of said die shoes folds said side wall panels slightly past normal relative to said bottom panel to press said additional end wall panels edgewise firmly against said bottom panel,

actuator means for extending and retracting said die plates toward and away from one another in timed relation to movement of said forming mandrel,

actuator means for expanding and contracting said mandrel normal to said die plates, and

means for operating said die plate and mandrel actuator means to extend said die plates and expand said mandrel in

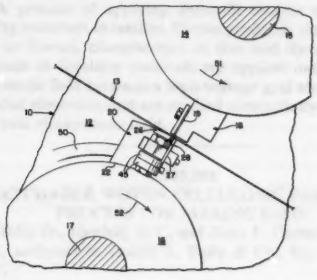
timed relation to the mandrel movement for pressing the folded bottom blank end wall panels between said mandrel and die plates.

4,345,906

CAM OPERATED GRIPPERS FOR PRINTED WEBS

Clyde G. Gregoire, Bensenville, Ill., assignor to Baldwin-Gregg, Inc., Lyons, Ill.

Filed Oct. 31, 1980, Ser. No. 202,599
Int. Cl.³ B65H 45/16
U.S. Cl. 493—432 4 Claims



1. An actuator for effecting the opening and closing of a movable gripper jaw for paper web folding machines for the printing industry which has a frame support of spaced apart walls, and operational folding roller journally carried for rotation in the spaced apart walls for engaging and folding the paper web, a working box carried transversely on the outer surface of the operational folding roller, the working box havinga stationary jaw on a top side and a cooperating movable gripper jaw on a front side and movable toward and away from the stationary jaw, said actuator comprising said working box having a block with an elongated horizontal groove therein disposed axially of said folding roller and open to the front side adjacent the movable gripper jaw, an elongated actuator memoer slidable endwise in said groove, said actuator member having a plurality of inclined cam slots at spaced apart intervals therealong, bolt members threadedly affixed in a vertical position from the top side of said block through the horizontal groove and into a lower side of said block and having one each extending through each of said inclined cam slots, roller members journalled on said bolt members at the position of said inclined cam slots, said roller members having a diameter just slightly smaller then the width of the inclined cam slots, said movable gripper jaw abutting the side of said actuator member at the open side of said block groove, a bridge member spaced outwardly of said movable jaw, means spaced from end portions of said movable jaw for joining the bridge member to said actuator member and permitting said movable gripper jaw to have limited separate movement between said actuator member and said bridge member, guide bolts having shank portions slidably passing through openings provided in said movable jaw and having ends threadedly engaging said block, said guide bolts having enlarged heads confining said movable jaw in proximity to said working box and its stationary jaw, cam means on said spaced apart walls for moving said actuator member along said block groove, rollers journally mounted on the ends of said actuator member and adapted to engage the cam means on said spaced apart walls, and said cam means in certain rotated positions of said operational folding roller moving said actuator member to one end of said elongated horizontal groove and causing said movable jaw to abut said stationary jaw, and said cam means in certain other rotated positions of said operational folding roller causing said actuator member to be shifted to the other end of the groove and to cause the roller members to slide to an opposite end of the inclined cam slots and effect an outward shifting of the movable jaw away from the stationary jaw.

4. A web gripper for use in a web folder comprising a frame structure, a folding roller journaled for rotation in said frame structure for engaging and folding a paper web, a working box carried transversely on the outer surface of said roller, the working box having a stationary jaw and an elongated endwise movable actuator axiallyslidable on said folding roller, cam means on said frame structure for effecting the sliding of said actuator, a movable jaw supported for movement on said endwise moving actuator, means guiding said moving jaw relative to said stationary jaw for movement towards and away from said stationary jaw, said means including a plurality of inclined cam slots within said endwise movable actuator at spaced apart intervals therealong, rollers affixed to the working box and disposed in each of the inclined cam slots to effect a positive movement of said moving jaw toward and away from said stationary jaw upon endwise movement of said actuator.

4,345,907

PROCESS OF APPLYING DYESTUFFS AND/OR CHEMICALS OR FINISHING MATERIALS TO TEXTILES, FIBROUS PRODUCTS, SHEET MATERIALS, PAPERS OR FLEECES

Günther Wegele, Iffeldorf; Gerhard Brink, Münchberg; Goetz Rotta, Weinheim; Manfred Roeth, Ludwigshafen, and Siegfried Wittmann, Mannheim, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Theodor Rotta GmbH & Co. KG, Mannheim, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,576

Int. Cl.³ D06P *5/20*

U.S. Cl. 8—444 11 Claims

1. A process of applying dyestuffs and/or chemicals or finishing materials to textiles, fibrous products, sheet materials, paper or fleeces, characterized in that said dyestuffs and/or chemicals or finishing materials are applied indirectly in an electrostatic field between a high-voltage grid electrode and a grounded electrode, and are applied substantially perpendicular to said electrostatic field.

4,345,908

STRETCHABLE WOVEN CELLULOSIC FABRIC AND PROCESS FOR MAKING SAME

Sigo Mohr, Jr., Hewlett, N.Y., and Jerry L. Carter, Gloverville, S.C., assignors to Joshua L. Baily & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 98,246, Nov. 28, 1979, abandoned. This application Nov. 21, 1980, Ser. No. 208,980

Int. Cl.³ D06M *1/06;* D06L *3/02*

U.S. Cl. 8—111 9 Claims

1. In a woven, predominantly cellulosic fabric, the improvement wherein the fabric has at least about 11 percent stretchability in the filling direction with less than about 6 percent growth over repeated washing and drying cycles and having wrinkle-resistance and shrinkage control within commercial tolerances, said improvement being obtained by the method comprising:

(a) subjecting a woven, predominantly cellulosic fabric precursor to warp-wise tension while maintaining the fabric in a relaxed state in the filling direction;

(b) mercerizing the fabric by contacting it with aqueous alkali, while maintaining the condition of step (a);

(c) subjecting the fabric treated in step (b) to a tensile force in the filling direction sufficient to impart to the fabric, while said force is being applied and while maintaining the warp-wise tension of step (a), a width of within about −1 and +3% of the initial greige width;

(d) washing the fabric treated in step (c) to substantially remove the aqueous alkali therefrom while maintaining the conditions of step (a);

(e) contacting the fabric obtained in step (d) with anhydrous liquid ammonia under the conditions or step (a) whereby the width of the emerging fabric is substantially less than the inital greige width; and

(f) subjecting the fabric obtained in step (e) to compressive shrinkage.

4,345,909

PROCESS FOR DYEING OR TREATING TEXTILE FIBRE MATERIALS

Christian Guth, Basel; Hanspeter Gysin, Aesch, and Jörg Binz, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 8, 1981, Ser. No. 261,994

Claims priority, application Switzerland, May 19, 1980, 3883/80

Int. Cl.³ D06P *1/62*

U.S. Cl. 8—477 16 Claims

1. A process for treating textile fibers with foam, comprising the step of applying to the textile fibers a foamed aqueous composition which contains dye, a fluorescent whitening agent or a fabric finishing agent, and additionally contains water and

(A) a fatty acid/alkanolamine reaction product or an alkylene oxide adduct of this reaction product and

at least two of the following components

(B) a fatty alcohol which is optionally mono-, di- or triethoxylated and which contains 8 to 22 carbon atoms in the fatty alcohol radical,

(C) an adduct of 5 to 15 moles of ethylene oxide and 1 mole of a fatty alcohol or a fatty acid, each containing 8 to 22 carbon atoms, or 1 mole of an alkylphenol containing a total of 1 to 12 carbon atoms in the alkyl moiety,

and

(D) an acid ester, or a salt thereof, of a polyadduct of 2 to 15 moles of ethylene oxide and 1 mole of a fatty alcohol containing 8 to 22 carbon atoms.

4,345,910

DYEING OF NCD POLYESTER FIBERS

Michele Vescia, Limburgerhof, and Sigismund Heimann, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,300

Int. Cl.³ D06P *1/651*

U.S. Cl. 8—610 4 Claims

1. A process for dyeing polyester fibers which do not require a carrier with disperse dyes by the exhaustion method at 20°–100° C. and pH 4–6, with liquor ratios of from 5:1 to 100:1, and dyeing times of from 30 to 180 minutes, wherein the dyeing is carried out in the absence of carriers and in the presence of from 0.5 to 20%, based on fiber weight, of a leveling agent consisting of an adduct of a C_5–C_{14}-alkylphenol or C_5–C_{14}-alkylnaphthol with from 4 to 25 moles of ethylene oxide.

4,345,911

DIAGNOSTIC AGENT FOR THE DETECTION OF BILIRUBIN IN BODY FLUIDS AND REAGENT SUITABLE THEREFOR

Helmut Kohl, Wetter, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Sep. 10, 1980, Ser. No. 185,763

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936745

Int. Cl.³ G01N *33/72*

U.S. Cl. 23—230 B 8 Claims

5. A method for detecting bilirubin in a body fluid, which method comprises contacting said body fluid with a diazonium salt of pyrazole and observing for a color change indicative of the presence of bilirubin.

4,345,912

URANIUM PROSPECTING BASED ON SELENIUM AND MOLYBDENUM

Gerald L. Bartz, Amarillo, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 12, 1980, Ser. No. 186,780

Int. Cl.³ G01N *33/24*

U.S. Cl. 23—230 EP 3 Claims

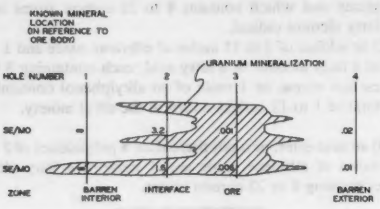
1. Uranium prospecting process useful for non-oxidized uranium deposits comprising

a. drilling one or more first holes through a formation,

b. obtaining at least one first sample of the formation material from said first hole or holes from a known depth in the formation,

c. determining the ratio of extrinsic selenium to extrinsic molybdenum of said sample, relating the location from which said sample had been taken as exterior or interior by categorizing said samples into interior and exterior samples based on the value of said ratio as compared to the ratio value from known location tests, the terms "extrinsic selenium" and "extrinsic molybdenum" referring to the

content of selenium or molybdenum in the surface matter of the sample particles; and



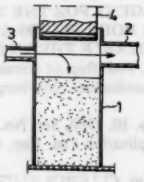
d. determining from said information obtained in step c. the location and/or shape of a uranium ore body.

4,345,913

METHOD AND APPARATUS FOR DETERMINING THE LIGNIN CONTENT IN PULP

Ann-Sofi Jönsson, Genarp, Sweden, assignor to Eur-Control Källe AB, Sweden

Filed Jan. 14, 1981, Ser. No. 225,134
Claims priority, application Sweden, Jan. 18, 1980, 8000434
Int. Cl.³ G01N *25/20*
U.S. Cl. 23—230 R **9 Claims**



1. A method for determining the lignin content in a pulp sample comprising:

(a) compressing the pulp sample to dewater same while simultaneously blowing gas of substantially no reactive capacity with regard to the lignin through the pulp sample, whereby a dewatered product of a definite low moisture content is obtained,

(b) blowing chlorine gas through the dewatered product resulting from (a), and

(c) measuring the maximum temperature rise resulting from (b).

9. Apparatus for carrying out the method in accordance with claim 1, and comprising a gastight measuring cell in which there is arranged a piston displaceable in the cell with the aid of a compressed air cylinder (4), characterized in that the piston (4) is provided with a channel (1) opening out in the measuring cell (1), through which channel air and chlorine gas are introducible into the measuring cell via valve means and that the measuring cell comprises in addition to a metal ring at the lower part of the measuring cell to sense the temperature of the pulp sample therein, a strainer plate formed in a movable plate with a cavity underneath, through which water and gas excess can be led off, at one end position said plate forming with its strainer plate the bottom of the measuring cell, and its other end position enabling blowing out of the pulp sample via a hole.

4,345,914

METHOD OF HEATING FINE-GRAINED SOLIDS

Roland Rammler, Königstein, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 33,644, Apr. 25, 1979, abandoned, which is a continuation of Ser. No. 823,777, Aug. 11, 1977, abandoned. This application Sep. 16, 1980, Ser. No. 187,856
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637427
Int. Cl.³ C10L *5/08*
U.S. Cl. 44—10 C **10 Claims**

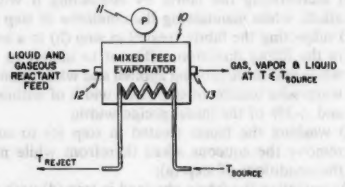
1. A process for heating a fine-grained coal or coke in direct contact with hot combustion gases which comprises feeding said coal or coke and oxygen containing hot gas to a vertical conveyor zone, heating and simultaneously partially combusting said coal or coke and effecting a considerable temperature rise of the coal or coke by the hot combustion gases and pneumatically transporting said coal or coke in said conveyor zone to a collecting zone, the coal or coke being thus heated to a temperature of 400°–800° C., causing said coal or coke to flow from said collecting zone to a final heating stage comprising a fluidized bed zone where the coal or coke is partially combusted in contact with oxygen-containing hot fluidization gases and being thus heated to a temperature of 500°–900° C., the coal or coke being thus heated in only two heating stages, and using the so-heated coal or coke in a mixture to produce briquettes or pellets.

4,345,915

MIXED FEED EVAPORATOR

Himanshu B. Vakil, Schenectady, and Philip G. Kosky, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,777
Int. Cl.³ C10J *3/16*
U.S. Cl. 48—197 R **9 Claims**



1. In the process in which (a) a preselected liquid is vaporized, (b) a gaseous reactant feed stream is heated, (c) the vapor so produced and the heated gaseous reactant feed are introduced into a reaction chamber for the conduct of a chemical reaction and (d) a reaction product stream is discharged from said reaction chamber, the improvement comprising the steps of:

mixing the preselected liquid and the gaseous reactant feed stream in a given molar ratio, the gas phase being substantially insoluble in said liquid,

intimately contacting the liquid and gaseous phases,

heating the resulting mixture by heat exchange with a fluid separate from said mixture, said fluid entering the heat exchange relationship at a temperature below the boiling point of said liquid at the total pressure of said mixture whereby vapor is generated from said liquid and

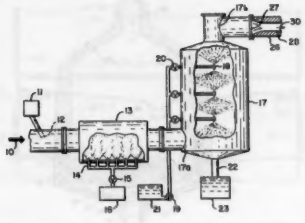
introducing the resulting mixed flow comprising heated gaseous reactant feed and vapor into said reaction chamber for conduct of said chemical reaction.

4,345,916

MEANS AND METHOD FOR REMOVING AIRBORNE PARTICULATES FROM AN AEROSOL STREAM

Clyde N. Richards, 4667 Ocean Blvd., #306, San Diego, Calif. 92019, and Marx Brook, 1216 North Dr., Socorro, N. Mex. 87801

Filed May 19, 1980, Ser. No. 151,352
Int. Cl.[3] B03C 3/01; B01D 37/00, 47/00, 51/04
U.S. Cl. 55—5 18 Claims



1. A method for removing airborne particulates from an aerosol stream, comprising the steps of
(a) saturating said aerosol stream with water vapor;
(b) supersaturating said saturated aerosol stream for a time sufficient to permit condensation of said water vapor upon, and growth of said particulates; and
(c) scrubbing said supersaturated aerosol stream, while maintaining said stream at supersaturation, whereby to remove said particulates therefrom.

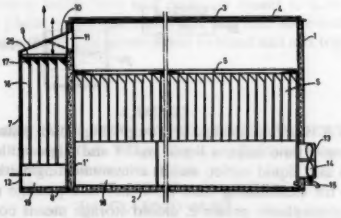
13. An apparatus for removing airborne particulates from an aerosol stream, comprising:
(a) means for saturating said aerosol stream with water vapor;
(b) means for supersaturating said saturated aerosol stream for a time sufficient to permit condensation of said water vapor upon, and growth of said particulates; and
(c) means for scrubbing said supersaturated aerosol stream, while maintaining said stream at supersaturation, whereby to remove said particulates therefrom.

4,345,917

METHOD AND APPARATUS FOR RECOVERY OF WATER FROM THE ATMOSPHERE

Peter Hussmann, Munich, Fed. Rep. of Germany, assignor to Mittex Aktiengesellschaft, Liechtenstein, Liechtenstein

Continuation of Ser. No. 18,698, Mar. 8, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 276,244
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810269
Int. Cl.[3] B01D 53/04
U.S. Cl. 55—33 36 Claims



1. A method of recovering water from air utilizing a main and an auxiliary heat reservoir comprising the steps of:
(a) during a desorption phase of operation:
(1) passing relatively dry, warm air through said auxiliary heat reservoir for preheating said air,
(2) subsequently passing said relatively dry, warm air through an adsorbent material for adsorption of moisture from said adsorbent material into said relatively dry, warm air
(3) then, passing said relatively warm air having moisture from said adsorbent material through said main heat reservoir, and
(4) condensing said moisture removed from said adsorbent material in said main heat reservoir, said main heat reservoir taking up heat of condensation in condensing said moisture,
(b) during a cold blowing phase of operation subsequent to said desorption phase:
(1) passing relatively cool air through said main heat reservoir for picking up at least a portion of said heat of condensation,
(2) passing said relatively cool air containing said heat of condensation through said adsorbent material and through said auxiliary heat reservoir for depositing said heat of condensation in said auxiliary heat reservoir,
(c) during an adsorption phase of operation:
(1) passing relatively humid, cool air through said main heat reservoir, and
(2) subsequently passing said air from said main heat reservoir through said adsorbent material for adsorption of moisture from said air into said adsorbent material, and
(d) repeating said steps (a), (b) and (c) whereby moisture is adsorbed from humid, cool air by said adsorbent material during said adsorption phase of operation, moisture is picked up from said adsorbent material and condensed in said main heat reservoir during said desorption phase of operation, and heat of condensation is transmitted from said main heat reservoir to said auxiliary heat reservoir during said cold blowing phase of operation.

4. A water recovery apparatus comprising:
(a) a main heat reservoir,
(b) a region of adsorbent material adjacent to said main heat reservoir for adsorption of moisture from relatively humid, cool air and for desorption of moisture therefrom into relatively dry, warm air,
(c) an auxiliary heat reservoir spacedly positioned from the region of adsorbent material and away from said main heat reservoir,
(d) means for generating a first air flow path during a desorption phase of operation through said auxiliary heat reservoir, then through said adsorbent material and subsequently through said main heat reservoir for passing relatively dry, warm air through said region of adsorbent material so that said relatively dry, warm air takes up moisture from said adsorbent material and condenses same in said main heat reservoir, said main heat reservoir taking up heat of condensation in condensing said moisture,
(e) means for generating a second air flow path during a cold blowing phase of operation through said main heat reservoir, then through said region of adsorbent material and then through said auxiliary heat reservoir for passing relatively cool air through said main heat reservoir for picking up at least a portion of said heat of condensation and transferring same to said auxiliary heat reservoir,
(f) means for generating a third air flow path during an adsorption phase of operation through said main heat reservoir, then through said region of adsorbent material for cooling said main heat reservoir and for passing relatively humid, cool air through said region of adsorbent material so that said adsorbent material picks up moisture from said relatively humid, cool air
whereby moisture is adsorbed from said humid, cool air by said adsorbent material during said adsorption phase, moisture is picked up from said adsorbent material and condensed in said main heat reservoir during said desorption phase of operation and heat of condensation is trans-

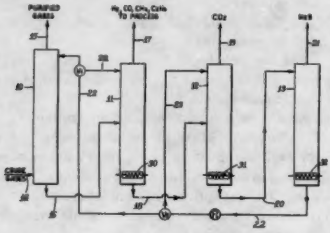
mitted from said main heat reservoir to said auxiliary heat reservoir during said cold blowing phase of operation.

4,345,918

PROCESS FOR PURIFICATION OF GAS STREAMS

Herman P. Meissner, Winchester, Mass., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Jan. 31, 1979, Ser. No. 7,988
Int. Cl.³ B01D *53/14*
U.S. Cl. 55—38 **16 Claims**



1. A process for separation of carbon dioxide and sulfur containing compounds from a gas stream comprising:

passing a gas stream containing undesired gases including carbon dioxide and sulfur containing compounds countercurrent to a liquid physical absorbent, dissolving the undesired gases in said physical absorbent in a physical solvent absorber, removing the purified gases from the upper portion of said physical solvent absorber and removing said liquid physica' absorbent containing dissolved gases from the bottom of said physical solvent absorber;

feeding the liquid physical solvent absorbent containing dissolved gases into the central region of a fractionating column, introducing liquid physical absorbent substantially free from dissolved gases in the upper region of said fractionating column and maintaining said fractionating column under conditions of temperature and pressure whereby at least one of said undesired gases passes from the upper region of said fractionating column and is removed from the process, said liquid physical solvent absorbent containing remaining dissolved gases passes from the lower region of said fractionating column, the introduction of feed to said fractionating column being at a location of said column at approximately the position wherein the column contents composition under operating conditions is the same as the feed composition, the pressure in said physical solvent absorber and said fractionating column being substantially the same.

4,345,919

DEGASSER FOR BIOLOGICAL FLUIDS

William R. Wilkinson, Mission City; Russell G. Sharp, Sugar Land; Charles C. Reed, Houston; Denton A. Cooley, Houston, and Terry N. Crane, Houston, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Jan. 19, 1981, Ser. No. 225,837
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—41 **15 Claims**

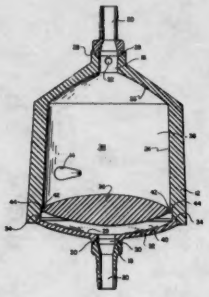
15. A method for separating gas bubbles from blood, the method comprising the steps of:

introducing blood into a first chamber in a container so as to minimize hemolysis of said blood and such that said blood has a vortical flow;

separating gas bubbles from the blood by utilizing centrifugal forces which are caused by said vortical flow and by utilizing gravitational forces;

removing the separated gas bubbles from the first chamber through an aperture extending from the first chamber to the exterior of said container;

directing the blood downward along interior walls of the first chamber and outward along the upper curved surface of a double convex baffle so as to collect said blood adjacent said interior walls and adjacent an outer perimeter of said baffle;



transferring the blood from which the gas bubbles have been separated through apertures adjacent the perimeter of the double convex baffle into a second chamber through utilization of gravity;

collecting the blood in said second chamber; and

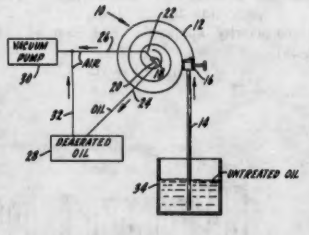
removing said collected blood from the second chamber through an aperture extending from the second chamber to the exterior of the container.

4,345,920

VACUUM DEAERATOR

Louis Ross, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 686,763, May 17, 1976, abandoned, which is a continuation of Ser. No. 535,533, Dec. 23, 1974, abandoned. This application Sep. 29, 1978, Ser. No. 947,211
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—46 **8 Claims**

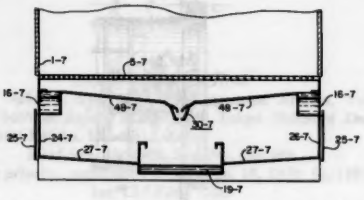


1. A vacuum deaerator comprising fluid passage means having a fluid inlet, a liquid outlet and a gas outlet separate from said liquid outlet, means communicating with said fluid inlet for establishing fluid flow into said passage means at a sub-atmospheric pressure, closed storage means communicating with said liquid outlet, and vacuum inducing means communicating with said storage means and said gas outlet for drawing gas therefrom at a pressure lower than said sub-atmospheric pressure.

4,345,921
SPRAY CHAMBER INCLUDING A WET SEPARATOR

Lennart Gustavsson, and Osten Maatta, both of S-Vaxjo, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Apr. 24, 1981, Ser. No. 257,158
Claims priority, application Sweden, Jul. 4, 1980, 8004943
Int. Cl.[3] B01D *47/10;* B05C *15/00*
U.S. Cl. 55—223 22 Claims



1. A wet separator comprising at least one exhaust venturi with an inlet for a flow of gaseous medium, a venturi throat and outlet means, said venturi throat being formed by opposed venturi sides converging toward the central axis of the at least one exhaust venturi in the direction of the gas flow from said inlet to said outlet, and means to cause liquid to flow into said at least one exhaust venturi along said sides, first guide plates extending inwardly from said opposed venturi sides adjacent said inlet and converging toward one another in said direction of flow and terminating in a noise-muffling zone defined between the plates and the venturi sides in advance of said venturi throat, said plates directing both said gas and said liquid flows into said zone to blend said flows in the noise-muffling zone.

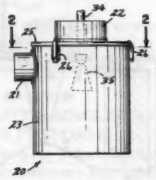
19. In a spray chamber having a grate-like floor, said grate-like floor having openings therethrough for the passage of particle-laden air downwardly therethrough, and an outlet for particle-laden air below said floor, said outlet comprising water reservoirs disposed below said floor along the periphery of the spray chamber and an exhaust venturi disposed centrally of said chamber below the floor between the water reservoirs and arranged to afford flow of said air in one direction therethrough, means to continuously supply water to said reservoirs to fill the reservoirs to overflowing and cause the water to flow into said exhaust venturi so as to provide a body of water underlying the openings in said grate-like floor, said exhaust venturi being formed by opposed venturi sides extending downwardly from said reservoir means and converging toward the central axis of the exhaust venturi in the direction of the air flow to define therebetween a venturi throat spaced below the reservoir means, the water from said reservoir means flowing along said venturi sides into said throat, and guide plates extending inwardly from said opposite venturi sides adjacent said reservoir means and converging toward one another in the direction of air flow with a greater angle of convergence than said venturi sides and terminating in a noise-muffling zone along said venturi axis above said throat, and means to cause water from said reservoir means to flow over said guide plates, along said plates and into said noise-muffling zone to cause the air and water flows to blend and mix together in said zone.

4,345,922
AIR CLEANER WITH ANTI-REENTRAINMENT

Eugene E. Grassel, Oak Ridge, Tenn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Dec. 22, 1980, Ser. No. 218,615
Int. Cl.[3] B01D *46/04*
U.S. Cl. 55—302 3 Claims

1. An air cleaner comprising, in combination:
a casing having a top wall, a bottom wall, an inlet for air to be cleaned and an axial outlet for cleaned air;
a filter mounted in said casing and positioned so as to separate said inlet from said outlet, said filter having a first, outer surface, a second, inner surface, and a substantially hollow interior defined by said inner surface, said interior being in fluid communication with said outlet, with entering air passing from said inlet to said outlet depositing particulate matter on said first surface of said filter with cleaned air passing through said filter interior to said outlet;
renewal means positioned in fluid communication with said filter interior for directing a flow of reverse-cleaning air against said second surface of said filter;
means for preventing redeposit, on said filter outer surface, of particulate matter dislodged by said renewal means, said means including a shroud positioned between and spaced apart from said filter and said casing and arranged so as to define a closed space therebetween, with said casing, said filter, and said shroud each being a substantially hollow cylinder;
inlet valve means in said shroud operative between a normal first, open condition, in which inflow of air from said inlet to said first surface of said filter is enabled, and a second,



closed condition, in which reverse airflow of the air from said filter to said inlet is prevented;
and outlet valve means located between said shroud and said filter and generally opposite said inlet valve means, said outlet valve means comprising a plurality of spaced-apart apertures in said casing bottom wall and a plurality of resilient, pressure-responsive shutters aligned with said apertures for opening and closing said apertures, said outlet valve means being operative between a normal first, closed condition, in which inflow of air from said inlet to said filter first surface is prevented, and a second, open condition, in which a reverse-cleaning, scavenging flow of air from said renewal means is enabled to pass through said filter, said reverse flow of air causing the pressure within said space to be greater than the pressure at said inlet and dislodging particulate matter from said filter, with said shutters moving said outlet valve means into said second, open condition as a result of the rise of the pressure within said closed space,
whereby said inlet and said outlet valve means are operative simultaneously in said first conditions and alternately, simultaneously, in said second conditions.

4,345,923
AIR PURIFIER WITH HERMETIC SEALING

Donald W. Schoen, St. Paul, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Apr. 3, 1981, Ser. No. 250,893
Int. Cl.[3] B01D *46/44, 50/00*
U.S. Cl. 55—314 12 Claims

8. An air purifier comprising, in combination:
a housing having an air inlet, an air outlet, a barrier between said inlet and said outlet, first upper bypass openings on opposite sides of said barrier, and second lower bypass openings on opposite sides of said barrier;
a bypass plenum mounted on said housing and including means for enabling a first flow path for air flow between said upper bypass openings, and means for disabling said first air flow path;

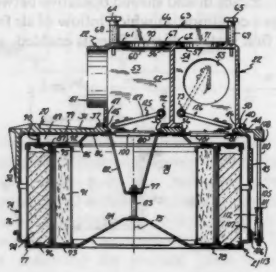
a filter canister positioned generally below said housing, said filter canister including a filter and having portions containing an inlet aperture and an outlet aperture, each aperture located adjacent one of said second lower bypass openings, said apertures and said openings allowing fluid communication between said filter canister and said housing for air flow through said filter and closure means at said apertures for preventing air flow through said filter canister,

and means for removing each of said closure means from said apertures to allow air flow through said filter.

12. An air purifier comprising, in combination:

(a) a housing having an air inlet, an air outlet, a barrier between said inlet and said outlet, said barrier having a portion with an opening therein, and a pair of bypass openings positioned on opposite sides of said barrier;

(b) a filter canister positioned adjacent said housing, said



canister including a filter, portions of said canister being adjacent said pair of bypass openings and containing an inlet aperture and an outlet aperture for allowing air flow between said housing and said filter canister, and closure means secured to each of said apertures for normally preventing air flow through said filter canister, said closure means comprising sheet metal members peripherally sealing said apertures and pull tabs secured to said sheet metal members for destroying said peripheral sealing and removing said members from said apertures;

(c) means for securing said filter canister to said housing, said canister apertures being aligned with a respective housing bypass opening;

(d) means mounted to said housing for activating said pull tabs; and

(e) valve means mounted on said closure means for simultaneously closing said barrier opening when said sheet metal members are removed from said apertures.

4,345,924

FILTER APPARATUS HAVING IMPROVED FILTER BAG SUPPORT STRUCTURE

Adolf Margraf, Am Schleplingsbach 46, D-3060 Stadthagen, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,336

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006823

Int. Cl.³ B01D *46/02*

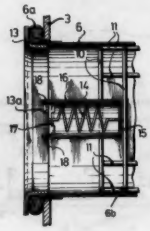
U.S. Cl. 55—379 **9 Claims**

1. In a gas-dust removing filter apparatus including a casing provided with a perforated partition which divides the casing into a dust-removing chamber and an accessible clean gas chamber, filter bags inserted into the dust-removing chamber of said casing via one of the perforations of said partition, and arranged to be cleaned by counterflow scavenging,

each of said filter bags having a rigid internal spacing element, and being provided at one end thereof with an open mouth disposed at the clean gas side of said partition and a neck portion disposed in the dust removing chamber, and at the other end thereof supported opposite to said partition, and a seal including a clamping frame to resiliently grip the rim of the open mouth of each of said filter bags between itself and the partition,

the improvement comprising;

said spacing element terminating in front of said partition, and



spring means connected at one end thereof to the clamping frame and at the other end thereof engaging the confronting end of said spacing element,

said spring means, when under stress, bearing against said neck portion and being supported together with respective parts of each of said filter bags on said partition at the side thereof of the dust-removing chamber.

4,345,925

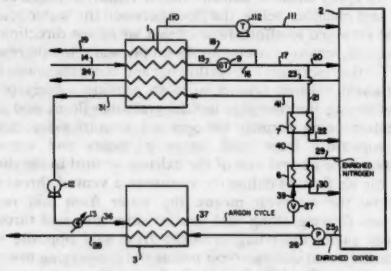
PROCESS FOR THE PRODUCTION OF HIGH PRESSURE OXYGEN GAS

Harry Cheung, Kenmore, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 26, 1980, Ser. No. 210,733

Int. Cl.³ F25J *3/04*

U.S. Cl. 62—13 **7 Claims**



1. A process for the production of oxygen gas at greater than atmospheric pressure comprising the steps of:

(a) introducing cleaned, cooled air into a distillation column;

(b) separating said air into oxygen-rich and nitrogen-rich fractions in said column;

(c) removing from said column at least a portion of said oxygen-rich fraction as liquid;

(d) pumping said liquid oxygen-rich portion to the desired pressure of at least about 600 psia;

(e) vaporizing said liquid oxygen-rich portion to oxygen gas at said desired pressure by indirect heat exchange with an argon containing fluid, recirculating in an essentially closed loop, said fluid comprising from 50 to 100 mole percent argon and from 0 to 50 mole percent oxygen;

(f) recovering said oxygen gas at said desired pressure;

(g) removing from said column at least a portion of a nitrogen-rich fraction as gas;

(h) condensing said gaseous nitrogen-rich portion by indirect heat exchange with said recirculating argon containing fluid; and

(i) returning said condensed nitrogen-rich portion back to said column, wherein said condensed nitrogen-rich portion is returned to said column in an amount sufficient to make up the nitrogen liquid reflux associated with said removed liquid oxygen-rich portion.

4,345,926

EXPANSION ENGINE

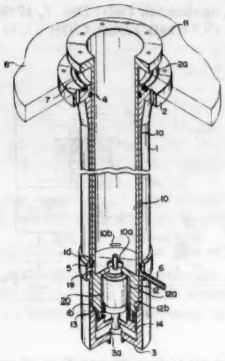
Shunichi Nakaya, Kawasaki, and Katsumasa Araoka, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 18, 1980, Ser. No. 188,495

Claims priority, application Japan, Sep. 18, 1979, 54/119743

Int. Cl.³ F25J *1/00*

U.S. Cl. 62—38 **11 Claims**



1. An expansion engine to be disposed so as to extend into a vacuum tank comprising:

an outer cylinder inserted in said vacuum tank and having its proximal end opening into the atmosphere;

an inner cylinder removably inserted from its distal side into said outer cylinder through said opening;

a piston capable of reciprocating inside said inner cylinder;

an intake valve mechanism disposed on the distal side of said inner cylinder and capable of moving together with said inner cylinder; and

seal means to seal the interface between said cylinders airtightly.

4,345,927

APPARATUS AND PROCESS FOR USE PREPARING A CONTINUOUS STRAND MAT

Charles E. Picone, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 31, 1980, Ser. No. 221,740

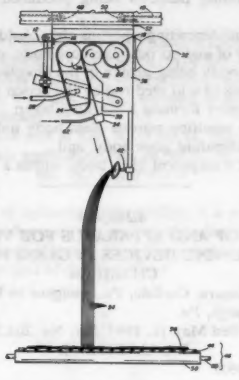
Int. Cl.³ C03B *37/02*

U.S. Cl. 65—4.4 **14 Claims**

9. Process for separating a bundle of strands into more than one group of strands to fall onto a moving conveyor to form a continuous strand mat comprising:

a. pulling the bundle of strands through a feeder for deposition onto the moving conveyor,

b. accelerating the bundle of strands from the feeder through an accelerating means to increase the strand speed over that speed given the strands by the puller means, and



c. deflecting the bundle of strands on a convex surface onto a moving conveyor to produce the mat.

4,345,928

FABRICATION METHOD OF SINGLE-MODE OPTICAL FIBER PREFORMS

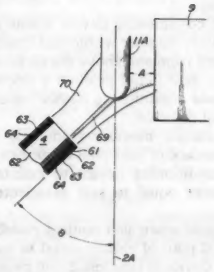
Masao Kawachi; Satoru Tomaru; Takao Edahiro, and Shoichi Suto, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,914

Claims priority, application Japan, Oct. 9, 1979, 54-129530; Jul. 11, 1980, 55-93841

Int. Cl.³ C03B *19/06*

U.S. Cl. 65—18.2 **7 Claims**



1. A method of fabricating a single-mode optical fiber preform from a seed rod having a longitudinal axis, comprising the steps of:

translating said seed rod along its longitudinal axis, said seed rod being rotated simultaneously with said translation;

producing a flame stream and a stream of fine glass particles located within said flame stream eccentric to the center area thereof, said flame and glass particle streams being directed against one end of said seed rod by a core torch inclined at an acute angle with respect to the longitudinal axis of said seed rod;

attaching and depositing said fine glass particles on said one end of said seed rod to form a porous glass core body, said porous glass core body being grown in the direction of said longitudinal axis of said seed rod by the action of said core torch;

exhausting non-reacted raw material for said porous glass

core body through at least one exhaust port disposed in the vicinity of said core body;

producing glass particles for cladding said core body, said glass cladding particles being produced by a cladding torch;

attaching and depositing a porous glass cladding body on the periphery of said porous glass core body, said porous glass cladding body being grown in the direction of said longitudinal axis of said seed rod by the action of said cladding torch thereby forming a cladding layer;

heating the resulting porous glass body until it is vitrified into a transparent glass body; and

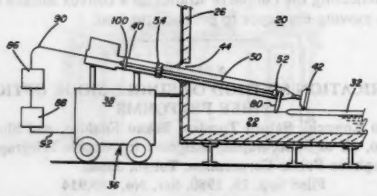
sealing said transparent glass body within a silica tube.

4,345,929

METHOD OF AND APPARATUS FOR VERTICALLY POSITIONING DEVICES IN GLASS FORMING CHAMBER

Edward M. Kapura, Carlisle, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 11, 1981, Ser. No. 262,263
Int. Cl.³ C03B *18/06*
U.S. Cl. 65—99.5 **19 Claims**



1. A method of vertically positioning a conditioning device in a glass forming chamber a preselected vertical distance relative to the surface of a pool of molten metal contained within the chamber upon which a ribbon of glass is supported, comprising the steps of:

suspending said conditioning device within said chamber;

mounting a contact member within said chamber in an initial position spaced from and above the surface of said pool of molten metal, said initial position a known vertical distance from said conditioning device equal to said preselected vertical distance;

moving said contact member from said initial position toward the surface of said pool of molten metal; while

moving said conditioning device to maintain said known vertical distance equal to said preselected vertical distance; and

generating a signal when said contact member engages the surface of said pool of molten metal to indicate that said conditioning device is positioned said preselected vertical distance relative to said pool of molten metal.

11. Apparatus for positioning a conditioning device in a preselected vertical position relative to a pool of molten metal which is contained in a forming chamber and upon which ribbon of glass is supported, comprising:

means for mounting said conditioning device within said chamber;

a contact chamber;

means for suspending said contact member in an initial position within said chamber over the pool of molten metal, said initial position a known vertical distance from said conditioning device which equals said preselected vertical distance;

means for generating a signal when said contact member engages said pool of molten metal;

means for moving said contact member from said initial position toward the surface of said pool of molten metal; and

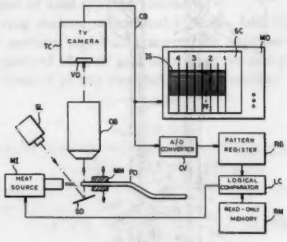
means for moving said conditioning device during movement of said contact member to maintain said known vertical distance equal to said preselected vertical distance.

4,345,930

PROCESS AND APPARATUS FOR SPHERICALLY CURVING AN END OF AN OPTICAL FIBER

Carlo P. Basola, and Guido Chiaretti, both of Milan, Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 5, 1980, Ser. No. 213,623
Claims priority, application Italy, Dec. 7, 1979, 69356 A/79
Int. Cl.³ B29D *11/00*; C03B *37/14*
U.S. Cl. 65—102 **7 Claims**



1. A process for providing an end face of an optical fiber with a convex curvature optimizing the transfer of luminous energy thereto from an adjoining light source, comprising the steps of:

heating a flat end of a stationary fiber by an axially aligned that source to an elevated temperature near the melting point of the fiber material;

projecting an enlarged image of the profile of the fiber end upon a receiving surface during the heating step;

monitoring changes in the shape of said image at said elevated temperature; and

terminating the heating of said fiber end upon said image reaching a shape satisfying a predetermined criterion.

5. An apparatus for providing an end face of an optical fiber with a convex curvature optimizing the transfer of luminous energy thereto from an adjoining light source, comprising:

stationary mounting means centered on an axis for holding an extremity of an optical fiber initially having a flat end face;

a heat source coaxial with said mounting means for confronting the end face of a fiber extremity held thereby and raising the temperature of said end face to a level near the melting point thereof;

magnifying means forming a light beam transversely intersecting said axis at said end face for projecting an enlarged image of the profile of said extremity upon a receiving surface; and

a recording of a predetermined criterion for the shape of said fiber end disposed for instantaneous comparison with the projected profile image for enabling a deactivation of said heat source upon detection of substantial agreement between said image and said criterion.

4,345,931

GELATED FERTILIZERS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE IN PLANT FERTILIZATION

Klaus Meyer, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1979, Ser. No. 87,944

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846831

Int. Cl.[3] C05C 9/00

U.S. Cl. 71—28 10 Claims

1. A water-soluble fertilizer paste consisting essentially of 58 to 88% by weight of a water-soluble plant nutrient selected from the group consisting of urea, N-, P-, K- and N,P,K-fertilizer salts, 4 to 12% by weight of a water soluble gelling agent selected from the group consisting of a polyglycol ether having at least 9 ethylene oxide units or a polyglycol ether derivative having at least 8 ethylene oxide units in the molecule or mixtures thereof and 8 to 25% by weight of water.

4,345,932

HERBICIDES

Peter S. Gates, Cambridge; John Gillon, Great Shelford, and David T. Saggers, Saffron Walden, all of England, assignors to Fisons Limited, London, England

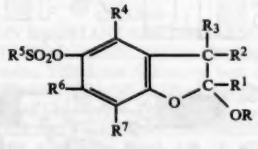
Continuation of Ser. No. 648,161, Jan. 12, 1976, Pat. No. 4,072,495, which is a continuation-in-part of Ser. No. 275,256, Jul. 26, 1972, abandoned, which is a division of Ser. No. 826,274, May 20, 1969, Pat. No. 3,689,507. This application Jun. 8, 1977, Ser. No. 804,752

Claims priority, application United Kingdom, May 24, 1968, 24858/68; Feb. 8, 1969, 6951/69; Apr. 8, 1969, 7985/69

Int. Cl.[3] A01N 43/08

U.S. Cl. 71—88 44 Claims

1. A herbicidal or plant growth retardant composition comprising a herbicidal or plant growth retardant amount of a mixture of (A) a benzofuranyl compound of the formula



wherein R is a member selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 4 carbon atoms, monochloro alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 6 carbon atoms, monochloro alkynyl of 2 to 6 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 and R^3 are the same or different and are hydrogen or alkyl of 1 to 4 carbon atoms; R^5 is alkyl of 1 to 4 carbon atoms or monochloro alkyl of 1 to 4 carbon atoms; and R^4, R^6 and R^7 are the same or different and are hydrogen, halogen or alkyl of 1 to 4 carbon atoms, and (B) a further herbicide, or plant growth retardant in admixture with at least one member of the group consisting of an inert carrier and a wetting agent.

4,345,933

SUCROSE ESTER OF 2-METHOXY-3,6-DICHLOROBENZOIC ACID

George F. Luteri, Mt. Prospect, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 115,637, Jan. 28, 1980, Pat. No. 4,291,158. This application Mar. 25, 1981, Ser. No. 247,471

Int. Cl.[3] A01N 43/08, 43/16

U.S. Cl. 71—88 4 Claims

1. A method of increasing the recoverable sugar contained in sugar cane which comprises contacting the sugar plant with an effective amount of sucrose tri(2-methoxy-3,6-dichloro-benzoate).

4,345,934

METHOD OF PRODUCING HYBRID CEREAL GRAIN SEEDS BY APPLICATION OF 1-ARYL-1,4-DIHYDRO-4-OXO(THIO)-PYRIDAZINES

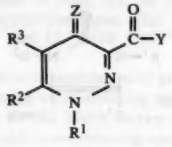
Ted T. Fujimoto, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 776,394, Mar. 10, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,029

Int. Cl.[3] A01N 43/58

U.S. Cl. 71—92 23 Claims

1. A method of inducing male sterility in a cereal grain or forage plant which comprises treating the plant prior to meiosis with an amount effective to produce male sterility in the plant of a compound of the formula



wherein

R^1 is an unsubstituted phenyl group or a phenyl group substituted with up to three substituents selected from the group consisting of halogen atoms, (C_1–C_4) alkyl, (C_1–C_4) alkoxy, (C_1–C_4) alkylthio, (C_1–C_4) alkylsulfinyl, (C_1–C_4) alkylsulfonyl or trifluoromethyl,

R^2 is a (C_1–C_4) alkyl group, or phenyl,

R^3 is a hydrogen atom, a (C_1–C_4) alkyl group, or a halogen atom, a benzyl group or a phenethyl group,

Z is oxygen or sulfur, and

Y is the group $Z'R^4$ or NR^5R^6

wherein Z' is oxygen or sulfur,

R^4 is hydrogen, (C_1–C_4) alkyl, (C_1–C_4) alkoxyalkyl, cyclohexylmethyl, bromopropyl, phenyl or benzyl,

R^5 and R^6 are independently selected from the group consisting of hydrogen or (C_1–C_4) alkyl or (C_1–C_4) alkyl substituted with carboxyl or (C_1–C_4) alkoxycarbonyl, or when

R^5 is hydrogen, R^6 is hydroxyl,

or an agronomically acceptable salt, (C_1–C_{12}) alkyl ester or mono or di(C_1–C_4) alkyl amide thereof.

4,345,935

2,4-IMIDAZOLIDINEDIONES, COMPOSITIONS AND HERBICIDAL METHOD

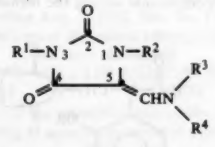
Thomas D. Thibault, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 5, 1981, Ser. No. 308,621

Int. Cl.[3] A01N 43/50; C07D 233/96

U.S. Cl. 71—92 31 Claims

1. A compound of the formula:



wherein: R^1 and R^2 independently are lower alkyl, phenyl, or phenyl substituted with one or two groups selected from halo, lower alkyl, halo lower alkyl, lower alkoxy or nitro, and R^3 and R^4 independently are methyl or ethyl.

25. A herbicidal composition comprising from about 0.1 to

about 95.0 percent by weight of a compound of claim 1 admixed with a suitable agricultural carrier.

4,345,936

IMIDAZOLES, COMPOSITIONS AND HERBICIDAL METHOD

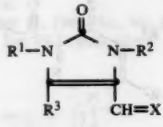
Thomas D. Thibault, Indianapolis, and Roger L. St. Clair, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 5, 1981, Ser. No. 308,728

Int. Cl.³ A01N *43/50*; C07D *233/68, 233/78, 233/86*

U.S. Cl. 71—92 **33 Claims**

1. A compound of the formula



wherein:

R^1 and R^2 independently are lower alkyl, cycloalkyl, phenyl, or phenyl substituted with one or two groups selected from halo, lower alkyl, lower alkoxy, halo lower alkyl, or nitro;

R^3 is chloro, lower alkoxy, lower alkylthio or NR^4R^5, in which R^4 is methyl or ethyl and R^5 is methyl, ethyl or propenyl; and

X is O or N-lower alkyl.

24. A herbicidal composition comprising from about 0.1 to about 95.0 percent by weight of a compound of claim 1 admixed with an agronomically acceptable carrier.

4,345,937

HERBICIDAL N-(HALOACETYL)-N-(N'-METHYLENEPYRROLIDONYL)-2-ALKOXYANILINES

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

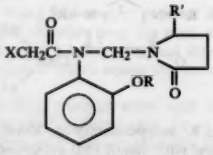
Division of Ser. No. 892,146, Mar. 31, 1978, Pat. No. 4,178,167, which is a continuation-in-part of Ser. No. 807,066, Jun. 16, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,306

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.³ A01N *43/36*; C07D *207/263*

U.S. Cl. 71—95 **8 Claims**

1. Herbicidal N-haloacetyl-N-(N'-methylenepyrrolidonyl)-2-alkoxyaniline compounds having the formula:



where R is alkyl of 1–6 carbon atoms, R' is hydrogen or lower alkyl of 1–3 carbon atoms, and X is chloro, bromo or iodo.

4,345,938

HERBICIDAL 2-HALOACETANILIDES

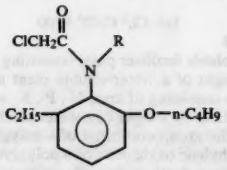
Gerhard H. Alt, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1980, Ser. No. 133,764

Int. Cl.³ A01N *37/22*; C07C *103/32*

U.S. Cl. 71—118 **12 Claims**

1. Compounds having the formula



wherein R is a C_{1-4} alkyl radical.

4,345,939

METHOD FOR PROVIDING OXYGEN ENHANCED AIR FOR USE IN METALLURGICAL PROCESSES

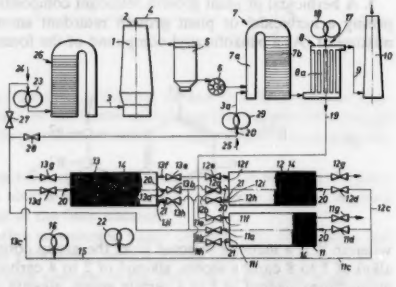
Günter Ratschat, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann DeMag A.G., Duisburg, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,977

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911763

Int. Cl.³ C21B *5/00*

U.S. Cl. 75—41 **9 Claims**



1. A method for regulating the percentages of individual gaseous constituents being provided to a metallurgical reaction process, comprising the steps of

(a) obtaining a supply of ambient air;

(b) passing said ambient air in a first direction through a zeolite molecular sieve material having a crystal lattice structure;

(c) entrapping inert gaseous constituents in said crystal lattice structure of said molecular sieve material, thereby enhancing the relative oxygen content of said air while simultaneously decreasing the absolute and relative amounts of said inert gaseous constituents of said ambient air;

(d) providing said now oxygen-enhanced air to a metallurgical reaction process for use therewith; and

(e) regenerating said molecular sieve material by first heating said molecular sieve material by passing a source of heated gas through said molecular sieve material in a second direction, said gas being heated by the recovered heat of said metallurgical reaction process, and by then cooling said molecular sieve material.

4,345,940

DESULFURIZING PROCESS

Peter J. Koros, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Incorporated, Pittsburgh, Pa.

Filed Apr. 13, 1981, Ser. No. 253,472
Int. Cl.[3] C21C 7/02
U.S. Cl. 75—58 10 Claims

1. In a process for desulfurizing a bath of molten iron contained in a vessel which comprises the step of

injecting particulate lime and a carbon-containing particulate compound containing at least carbon and hydrogen in proportions ranging from $CH_{>0}$ to CH_2

the improvement wherein:

said carbon-containing particulate compound is of a type which has a volatile matter concentration of 5 to 20%, by weight.

4,345,941

NON-PICK-UP AND HEAT RESISTANT ALLOY

Hisashi Hiraishi; Toshiaki Morichika, and Shinichi Murakami, all of Hirakata, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Dec. 11, 1979, Ser. No. 102,367
Claims priority, application Japan, Dec. 14, 1978, 53-155288
Int. Cl.[3] C22C 30/00
U.S. Cl. 75—122 4 Claims

1. A non-pick-up and heat resistant alloy consisting essentially of, by weight:

0.1–0.5% C,
1.0–1.8% Si,
$0 < Mn \leqq 2.0\%$,
26–30% Cr,
34–40% Ni,
$3 \leqq Co \leqq 9\%$,
0.5–3.0% Mo,
0.5–5.0% Nb,
0.5–10% W, and
balance Fe;

wherein the total amount of Ni and Co is 37–43%.

4,345,942

ABRASION RESISTANT SINTERED ALLOY FOR INTERNAL COMBUSTION ENGINES

Kentaro Takahashi; Yoshikatsu Nakamura, both of Omiya, and Masajiro Takeshita, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,256
Claims priority, application Japan, Apr. 26, 1979, 54/50932
Int. Cl.[3] B22F 3/12
U.S. Cl. 75—237 4 Claims

1. An abrasion resistant sintered alloy for use in internal combustion engines which comprises 0.5 to 4.0% by weight of carbon, 1.5 to 16.0% by weight of Nb, 0.1 to 4.0% by weight of Mo, 0.1 to 10.0% by weight of Ni and 0.1 to 5.0% by weight P which permits liquid-phase sintering at temperatures not higher than 1,250° C., and the balance Fe and have 0.2 to 10% by volume of sintering pores at least 40% of which consist of pores having a pore size of not larger than 150 μm.

4,345,943

ABRASION RESISTANT SINTERED ALLOY FOR INTERNAL COMBUSTION ENGINES

Kentaro Takahashi; Yoshikatsu Nakamura, both of Omiya, and Masajiro Takeshita, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,231
Claims priority, application Japan, Apr. 26, 1979, 54-50850
The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.
Int. Cl.[3] B22F 3/12
U.S. Cl. 75—238 8 Claims

1. An abrasion resistant sintered alloy for use in internal combustion engines which comprises 0.5 to 4.0% by weight of C, 5.0 to 30.0% by weight of Cr, less than 10.0% by weight of at least one of Ni, Mo, Co and Cu, 0.1 to 5.0% by weight of at least one of P, B and Si which permits a low temperature liquid-phase sintering at temperatures not higher than 1,250° C. and the balance iron, and have hardness after sintering of Hv 500 to 1,200, 7 to 45% by area ratio of cementite or eutectic crystal of cementite and P and 0.2 to 10% by volume of sintering pores at least 40% of which consist of pores having a pore size of not larger than 150 μm.

4,345,944

CEMENT ADDITIVE

Yoshiteru Kazama; Isao Kokubo; Akitoshi Tsuji, and Yukio Tanino, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 244,405
Claims priority, application Japan, Mar. 31, 1980, 55-41384
Int. Cl.[3] C04B 7/35
U.S. Cl. 106—90 8 Claims

1. A cement additive comprising solid granules, the individual granules comprising water-reducing agent deposited on or adhered to a solid carrier which carrier is compatible with hydraulic cement, said water-reducing agent being composed principally of naphthalene-sulfonic acid/formaldehyde high molecular weight condensate, or salt thereof, and being effective for preparing a hydraulic cement composition, said cement additive having been formed by molding into granules a mixture consisting essentially of from 12 to 87 parts by weight of said condensate and from 88 to 13 parts by weight of CaO, together with water necessary for granulation.

4,345,945

METHOD FOR DISPERSING COMMINUTED SOLIDS

Glenn N. Robinson, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 9, 1980, Ser. No. 214,606
Int. Cl.[3] C09C 1/36, 1/02
U.S. Cl. 106—300 16 Claims

13. An aqueous slurry of a comminuted pigment consisting essentially of a pigment, water and the salt of 2-amino-2-methyl-1-propanol reacted with phosphoric acid in a 1–3:1, respectively, mole ratio.

4,345,946

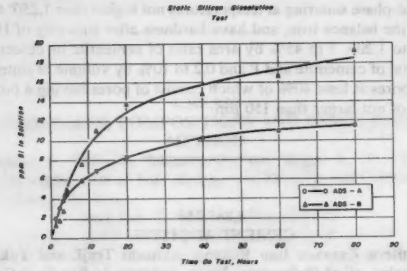
PROCESS FOR USE OF A ZEOLITE MOLECULAR SIEVE ADSORBENT IN AN AQUEOUS SYSTEM

Hosheng Tu, Shorewood, and Juana E. Rojo, La Grange, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 75,576, Sep. 14, 1979, abandoned. This application Aug. 1, 1980, Ser. No. 174,474
The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.
Int. Cl.[3] C13K 3/00; C13D 3/12; C13K 11/00, 3/00
U.S. Cl. 127—46.3 6 Claims

1. In a process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with a zeolite, the silicon constituent of said zeolite tending to dissolve in said solution resulting in the undesirable disintegration of said zeolite, the improvement which comprises impregnating said zeolite, prior to said contacting with said aqueous solution, with aluminum

cations, thereby effecting a chemical reaction between said zeolite and said aluminum cations which substantially reduces



the extent of dissolution of said silicon constituent and the extent of said disintegration of said zeolite.

4,345,947

CLARIFICATION OF GLUCOSE SYRUPS

John T. Rundell, Keston; Paul R. Pottage, Bromley, and Ronald J. Harradine, Caterham, all of England, assignors to Tate & Lyle Limited, England

Filed Apr. 28, 1981, Ser. No. 258,440
Int. Cl.³ C13K *1/00, 1/06*
U.S. Cl. 127—48 **15 Claims**

1. A process for the clarification of a hydrolysed starch syrup, which process comprises the steps of forming in the syrup at a pH of 3.5 to 6.5 a primary floc formed between aluminum ions, hydroxide ions, and phosphate ions; aerating said syrup containing said primary floc; distributing an anionic organic polymeric flocculant through said syrup after aeration to initiate formation of a secondary floc; allowing said secondary floc to grow, and to segregate by flotation, giving flocculated solids and clarified syrup; and separating said flocculated solids from said clarified syrup.

4,345,948

METHOD FOR DEWATERING STARCH SLURRIES CONTAINING SWOLLEN STARCH GRANULES

William F. Breuninger, Greenwood, Ind., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 13, 1981, Ser. No. 282,353
Int. Cl.³ C13L *1/08*
U.S. Cl. 127—70 **5 Claims**

1. In a process for the washing of starch conversion products containing swollen starch granules in a continuous centrifugal device, the improvement which comprises adding to the starch slurry 0.1 to 1%, based on weight of starch solids, of a cationic polymer which is a water-soluble acid salt of an aminoalkyl ester of a carboxylic acid polymer thereby increasing the production rate and yield while reducing suspended solids in the effluent.

4,345,949

CLEANING REACTORS CONTAMINATED WITH CARBOXYL CONTAINING POLYMERS

Hung S. Park, Avon Lake, Ohio; William D. Ryan, Jr., Paducah, Ky., and Harold L. Paine, Wellington, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 30, 1981, Ser. No. 229,705
Int. Cl.³ B08B *3/08, 3/10, 9/08*
U.S. Cl. 134—22.16 **7 Claims**

1. A process for cleaning a polymerization vessel contaminated with carboxyl containing polymers adhering to the inner surfaces thereof comprising adding to said vessel a trivalent metal salt, a surface active agent and water, heating the resulting solution and stirring to effectively remove said deposit of carboxyl containing polymer.

4,345,950

METHOD FOR MAKING A COMPOSITE GRAINED CAST ARTICLE

Kevin S. O'Hara, Peabody, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 21, 1980, Ser. No. 142,527
Int. Cl.³ C22F *1/10*
U.S. Cl. 148—2 **3 Claims**

1. A method for making a composite grained unitary cast article from a unitary casting of a high temperature superalloy based on at least one element selected from the group consisting of Ni and Co, comprising the steps of:

providing the unitary cast article in the single grained condition from an alloy which has good creep rupture and thermal fatigue high temperature properties in the single grained condition and is capable of developing good high cycle fatigue resistance properties in a lower temperature range of up to about 1300° F. in a multi-grained condition;

subjecting a first portion of the single grained article intended to operate in the lower temperature range to mechanical work to provide permanent plastic deformation in the surface of the first portion sufficient to enable recrystallization of the first portion when the first portion is heated at a recrystallization temperature, said recrystallization temperature being from at least the gamma prime solution temperature range of the alloy up to but not including that temperature which affects detrimentally the alloy of the article when the superalloy is based on Ni, and being from at least about 1600° F. up to but not including that temperature which affects detrimentally the alloy of the article when the superalloy is based on Co; and then

heating at least the first portion of the article at the recrystallization temperature for a time sufficient to recrystallize the first portion of the article to a multi-grained condition thus to provide the recrystallized first portion with high cycle fatigue resistance greater than that of the remaining single grained portion.

4,345,951

PROCESS FOR THE MANUFACTURE OF HOLLOW BODIES MADE OF ALUMINUM ALLOY AND PRODUCTS THUS OBTAINED

Jean Coupry, Voiron, and Marc Anagnostidis, Chamalieres, both of France, assignors to Societe Metallurgique de Gerzat, Paris, France

Filed May 30, 1980, Ser. No. 155,116
Claims priority, application France, Jun. 1, 1979, 79 15054
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—2 **7 Claims**

1. A process for obtaining from an alloy in the non-recrystallized state a hollow body which is resistant to an internal pressure comprising tensile stress and bursting stress which are higher than or equal to 660 MPa and a lengthwise breaking elongation greater than or equal to 9% when tensile stress=660 MPa, comprising at least the following steps:

(a) casting a billet of an alloy essentially consisting by weight:

Zn		7.6 to 9.5%
Cu		1.0 to 1.8%
Mg		2.4 to 3.5%
Cr		0.07 to 0.17%
Mn		0.15 to 0.25%
Zr		0.08 to 0.14%
Fe	VIII VII VI	0.20%
Si	VIII VII VI	0.15%
Ti	VIII VII VI	0.10%
Others each	VIII VII VI	0.05%
Others total	VIII VII VI	0.15%
Remainder		Al

(b) homogenizing said billet;
(c) hot extruding said billet to provide a hollow body; and
(d) heat treating the extruded hollow body by solution treatment, quenching and artificial ageing (T_6 state).

4,345,952

METHOD FOR THE MANUFACTURE OF TUBES FROM STEEL HAVING HIGH DUCTILITY AT LOW TEMPERATURE

Alain L. A. Royer, Vandoeuvre les Nancy; Eugene Herzog, Nantes, and Robert M. L. Rouyer, Fumel, all of France, assignors to Pont-A-Mousson S.A., Nancy, France

Continuation of Ser. No. 47,964, Jun. 12, 1979, abandoned. This application Dec. 2, 1980, Ser. No. 212,166
Claims priority, application France, Jun. 12, 1978, 78 17864
Int. Cl.³ C21D *9/08*
U.S. Cl. 148—3 **13 Claims**

1. A method for manufacturing a tube from low carbon alloyed steel adapted to be welded, comprising the steps of: selecting a steel having at the most, as a percentage by weight, in addition to iron, 0.08% carbon, at the most 0.30% silicon, between 1.20 and 2.20% manganese and at least one metal-generating special carbide such as molybdenum, centrifugally casting a steel having contents of molybdenum from 0.42% to 0.50% and aluminum from 0.02% to 0.08% by weight in a centrifugal casting mould to form a tube, and subjecting the centrifugally cast tube after being extracted from the mould to at least controlled cooling, hardening and annealing to produce a mean KCV coefficient of resilience according to ASTM-E-23-64 at minus 40° C. of 148 to 220 joules.

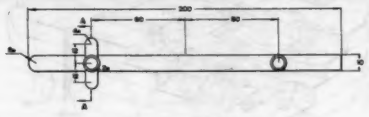
4. A centrifugally cast and weldable tube of weldable steel comprising: a centrifugally cast low carbon alloyed steel tube, said tube thus cast subjected to at least controlled cooling, hardening and annealing and said low carbon alloyed steel comprising by weight, in addition to iron, at the most 0.08% carbon and at the most 0.30% silicon, manganese between 1.20 and 2.20%, at least one metal-generating special carbide and having a homogeneous ferritic structure having fine grains with stable carbides dispersed in a homogeneous manner in the ferrite, comprising molybdenum from 0.42% to 0.50%, aluminum from 0.02% to 0.08% and, vanadium 0.10% and/or traces of niobium the tube having a mean KCV coefficient of resilience according to ASTM-E-23-64 at minus 40° C. of 148 to 220 joules.

4,345,953

ALUMINUM-BASED DIE CASTING ALLOYS

Nobuo Kaneko, Minami Magome, and Masaru Yamamoto, Tokyo, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1980, Ser. No. 182,312
Int. Cl.³ C22C *21/06*
U.S. Cl. 148—32 **9 Claims**



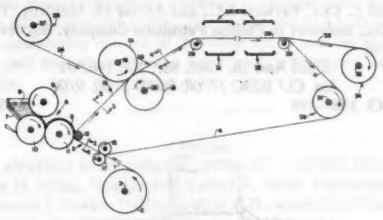
1. A die cast product having high strength and free from hot cracks made from an aluminum-based die casting alloy consisting essentially of 4–8% by weight of Zn, 6–11% by weight of Mg and the balance aluminum.

4,345,954

METHOD OF MAKING LAMINATES

Paul Panchu, Jamaica Plain, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 23, 1979, Ser. No. 23,310
Int. Cl.³ H01M *6/12*
U.S. Cl. 156—87 **20 Claims**



1. The method of making a triplex laminate of cellophane, electrode particles and conductive plastic, comprising the steps of laminating under pressure a sheet of conductive plastic, a sheet of cellophane, and an intermediate layer of an aqueous dispersion of electrode particles and a binder in which said aqueous dispersion comes into contact with the conductive plastic sheet at least as soon as it comes in contact with the cellophane sheet, and drying said laminate to remove moisture from said dispersion by diffusion through said cellophane sheet.

4,345,955

PROCESS FOR MANUFACTURING MULTILAYER CERAMIC CHIP CARRIER MODULES

Frank C. Bakermans, Shiremanstown, and Lee R. Conrad, Lewisberry, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

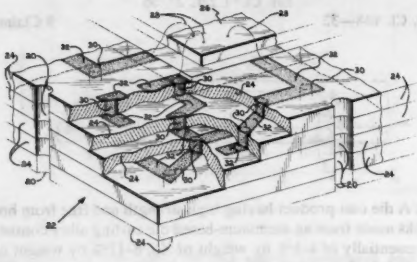
Continuation-in-part of Ser. No. 201,469, Oct. 28, 1980, abandoned. This application Oct. 2, 1981, Ser. No. 307,657
Int. Cl.³ B32B *31/06*; C04B *39/12, 35/10*
U.S. Cl. 156—89 **10 Claims**

1. A process for producing a multilayer ceramic module for use with integrated circuits comprising:
(a) mixing together a nonconductive particulate material suitable for preparing a ceramic body with a binder at a temperature above the melting point of the binder and injecting said mixture into a mold containing predesigned ridges, heating and pressuring said mixture in the mold and then causing

said binder to be hardened by cooling to form a ceramic "green body" layer,

(b) applying a conductive paste to the formed ceramic layer,

(c) pressing together two or more of said layers to form a module,



(d) exposing said green body in a vapor of a solvent for said binder and thereafter a bath of a liquid solvent for said binder maintained at a temperature above the melting point of said binder, and

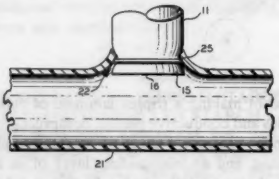
(e) sintering said module.

4,345,956

METHOD FOR MAKING A PIPE CONNECTION OR FITTING

Russell C. Cox, Taylors, S.C., and Arthur H. McElroy, Tulsa, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 16, 1980, Ser. No. 140,901
Int. Cl.³ B29C *17/08;* B29D *3/00, 9/00*
U.S. Cl. 156—198 **5 Claims**



1. A method for connecting a first end of a first pipe to a container in such a manner that the transverse surface of the first end of said first pipe is substantially flush with the inside surface of the portion of the wall of said container to which the first end of said first pipe is connected, wherein at least the first end portion of said first pipe which is connected to said container and at least the portion of the wall of said container to which the first end portion of said first pipe is connected comprises a synthetic thermoplastic polymeric material which has a plastic memory, said method comprising the steps of:

cold-swaging the first end portion of said first pipe to form an inwardly tapered first end portion of said first pipe;

forming a hole in said wall of said container which is smaller than but similar to the outside configuration of the untapered portion of said first pipe;

cold expanding the portion of the wall of said container which is adjacent said hole in such a manner that the wall of said container adjacent said hole extends outwardly from the remaining portion of said container to form an expanded hole in said wall of said container which is larger than but similar to the outside configuration of the largest portion of the inwardly tapered first end portion of said first pipe which must be inserted into the expanded hole in said wall of said container;

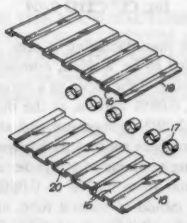
inserting the inwardly tapered first end portion of said first pipe into the expanded hole in said wall of said container in such a manner that the transverse surface of the inwardly tapered first end portion of said first pipe is substantially flush with the inside surface of the portion of the wall of said container which is substantially adjacent said hole, the plastic memory of at least the first end portion of said first pipe which is connected to said container causing the inwardly tapered first end portion of said first pipe to expand and the plastic memory of at least the portion of said wall of said container to which the first end portion of said first pipe is connected causing the expanded hole in the wall of said container to contract, thus forming a connection between said first pipe and said container wherein the transverse surface of the first end portion of said first pipe which extends through the hole in said wall of said container is substantially flush with the inside surface of the portion of the wall of said container which is substantially adjacent said hole and wherein the plastic memory of said synthetic thermoplastic polymeric material causes the formation of said connection without the necessity of applying other forces to said synthetic thermoplastic polymeric material.

4,345,957

POLYMERIC ARTICLES

Pushpkumar D. Changani, Swindon; Donald G. Peacock, Kempsford, and David Roberts, Broome Manor Swindon, all of England, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 28, 1980, Ser. No. 172,899
Int. Cl.³ H02G *15/18, 1/14;* B29C *27/24;* H05B *3/10*
U.S. Cl. 156—218 **11 Claims**



1. A process for the production of a hollow heat-recoverable article provided with a functional insert, the steps comprising:

deforming a substantially non-cross-linked polymeric material at a temperature below the crystalline melting point or softening point of the material to render the material heat-recoverable primarily in one direction;

disposing a functional insert in contact with an exposed portion of said material;

fusing together parts of the deformed material to at least one other non-cross-linked polymeric component said fusing being done along lnes substantially perpendicular to the direction of polymeric material heat-recoverability to produce at least one hollow radially inwardly heat-recoverable article with the functional insert located therein; and,

cross-linking the fused portions of the polymeric material.

4,345,958

METHOD OF MAKING AN APPLIQUE ARTICLE

Minoru Kuroda, Amagasaki, Japan, assignor to Nishigawa Shoji Co. Ltd., Tokyo, Japan and Dimension Weld International Corp., Stamford, Conn.

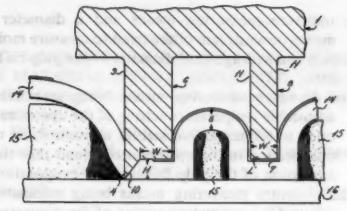
Continuation of Ser. No. 764,917, Feb. 2, 1977, Pat. No. 4,209,354, which is a continuation of Ser. No. 646,960, Jan. 7, 1976, Pat. No. 4,160,684, which is a continuation-in-part of Ser. No. 393,791, Sep. 4, 1973, abandoned, which is a continuation of Ser. No. 113,088, Feb. 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned, and a continuation-in-part of Ser. No. 112,403, Feb. 3, 1971, abandoned, which is a continuation of Ser. No. 792,719, Jan. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned. This application Jun. 19, 1979, Ser. No. 50,114

Claims priority, application Japan, Dec. 19, 1966, 41-83085; Dec. 19, 1966, 41-115532; Dec. 19, 1966, 41-115533; Dec. 19, 1966, 41-115535

The portion of the term of this patent subsequent to Dec. 21, 1988, has been disclaimed.

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—221 8 Claims



1. A method of applying an applique to a support, comprising the steps of providing a cover layer of synthetic plastic sheet material having a design surface with an outer contour line and at least a narrow outer bonding zone along said outer contour line, and at least one inner bonding zone spaced from the outer zone; further providing an intermediate layer of a resiliently compressible latently adhesive thermoplastic material; sandwiching said intermediate layer between said cover layer and a support material; and pressing against said cover layer die means having inner and outer pressure faces, said outer pressure face corresponding to said outer bonding zone and a raised cutting edge fixed along said outer pressure face and corresponding to said contour line, while activating said latently adhesive thermoplastic material of said intermediate layer and thereby bonding said cover layer by said intermediate layer in said outer bonding zone to said support material and while severing only said cover layer and intermediate layer along said outer contour line, the presence of said intermediate layer resulting in formation of a cushion between said support material and said cover layer in the area surrounded by said outer bonding zone upon bonding of said cover layer to said support material.

4,345,959

PROCESS FOR PRODUCING THERMOSETTING RESIN FILM

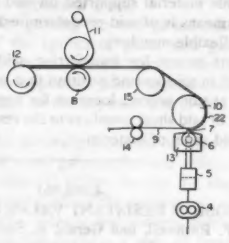
Hajime Asai; Hisashi Tada, and Takeo Gomi, all of Ootake, Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,537

Int. Cl.³ B29D *7/02*

U.S. Cl. 156—244.11 14 Claims

1. An improvement in a process for producing a thermosetting resin film, wherein a molten heat curable thermosetting resin composition which is fluid at less than 100° C. and has a curing agent incorporated therein is extruded through a linear slit of a flat die, maintained at a constant temperature, onto a release sheet continuously moving at a constant rate in close proximity to the exit end of the linear slit, said improvement comprising (i) using as a non-solvent thermosetting resin in the molten thermosetting resin composition a resin which is fluid at a temperature of less than 100° C. and which is solid at room temperature, the molten thermosetting resin composition being a non-solvent type thermosetting resin composition which is prepared in the absence of a solvent by mixing in a mixer the ingredients of the composition which consists essentially of thermosetting resin, a monomeric precursor for the resin and



curing agent with or without unreacted cross-linking agent and filler, the curing agent being dissolved in the monomeric precursor, (ii) using as the flat die a flat sheeting die having a substantially circular manifold into which the thermosetting resin composition is fed and (iii) extruding the molten thermosetting resin composition maintained at a temperature of lower than 100° C. onto the release sheet supported by a back-up roll and confronting the exit of the linear slit of said flat sheeting die; said back-up roll being fitted with self-aligning bearing means.

4,345,960

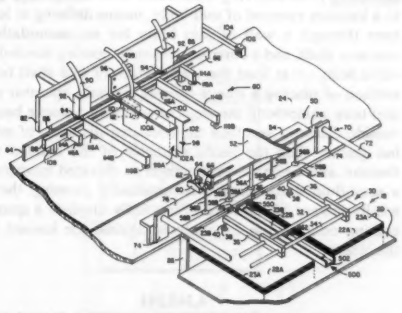
SYSTEM FOR AND METHOD OF LAMINATING

John D. Mims, Hopkington; Leland F. Mills, Dunbarton, and Ronald I. Fowler, Pittsfield, all of N.H., assignors to Crathern Engineering Co., Inc., Contoocook, N.H.

Filed May 29, 1981, Ser. No. 268,197

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—264 24 Claims



1. Apparatus for laminating sheet members respectively to select portions of a sheet of material, at least one of said sheet members being made of a relatively flexible and thin material of a predetermined length, and at least one other of said sheet members being made of a relatively stiff and thicker material, said apparatus comprising, in combination:

supporting means at a first location for supporting said members, each at a respective first position, said supporting

means including flexible member support means for supporting said flexible member;

lifting means at said first location for lifting at least a portion of each sheet member from said first position to a respective second position, said lifting means including means for moving said flexible member support means between the respective first and second positions of said flexible member;

feed means for feeding flexible material onto said flexible member support means at said first position;

cutting means for severing said flexible material so that said flexible material supported on said flexible member support means is of said predetermined length so as to form said flexible member;

transport means for transferring said sheet members disposed in said second position to a second location; and

means at said second location for registering and securing each of said sheet members to the respective select portion of said sheet of material.

4,345,961

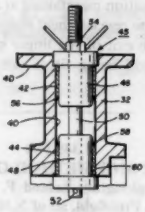
CORROSION RESISTANT VALVE CONSTRUCTION

Thomas F. Rothwell, and Gerald B. Smith, both of Bradford, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 151,222, May 19, 1980, Pat. No. 4,303,094. This application Mar. 27, 1981, Ser. No. 248,665

Int. Cl.³ B32B *1/10*; F16K *1/22*

U.S. Cl. 156—294 **4 Claims**



1. In a pipe line valve for corrosive service including a metal body defining a flow passage between an inlet and an outlet, a closure member in said passage, a rotatable operator shaft extending from a driving connection with said closure member to a location external of said body, means defining at least one bore through a wall of said body for accommodating said operator shaft, and a corrosion resistant coating bonded to said valve body on at least the wall surface of said shaft bore, the method of placing a sleeve bearing for said operator shaft in said bore comprising the steps of selecting a sleeve bearing of outside diameter less than the uncoated diameter of said bore but greater than the inside diameter of the bonded coating thereon, and while the coating is at an elevated temperature in a semi-fluid unhardened state gradually pressing the sleeve axially inward of the bore to inwardly displace a quantity of coating composition encountered against the inward face of the sleeve.

4,345,962

CONTROL IN APPLICATION OF PULP INSULATION TO ELECTRICAL CONDUCTORS

William E. Cowley, Ottawa; Michael A. Shannon, Glen Burnie, and Victor L. LeNir, Montreal, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 25, 1981, Ser. No. 277,327

Int. Cl.³ H01B *3/48*

U.S. Cl. 156—356 **7 Claims**

1. Apparatus for pulp insulating a plurality of conductors comprising:

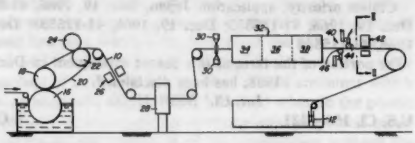
a pulp bath for simultaneous passage of the conductors along side-by-side paths;

weight measuring means to measure the weight of wet pulp applied to the conductors;

means to adjust the amount of pulp fibre entering the bath per unit time;

control means, actuable by signals received from the weight measuring means and corresponding to the actual weight of pulp per unit length, to operate the pulp fibre amount adjusting means to change the amount of the pulp fibre in the bath and thus to bring the weight within preset limits;

an oven for drying the pulp, said oven being composed of at least two zones, an upstream zone and a downstream zone, said zones each having an adjustable drying temperature setting;



a moisture measuring means and a diameter measuring means downstream of the oven to measure moisture retention and average final diameter of the pulp on the conductors;

the diameter measuring means being associated with the adjustable temperature setting of the upstream zone of the oven to influence that setting to control the rate of flash evaporation in the upstream zone and thus the degree of expansion of the pulp during flash evaporation; and

the moisture measuring means being associated with the adjustable temperature setting of the downstream zone of the oven to control the rate of drying in the downstream zone to provide a desired moisture retention in the pulp upon the insulated conductors emerging from the oven.

4,345,963

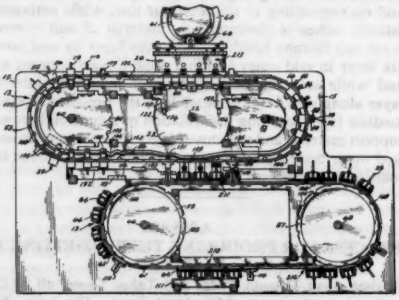
ASSEMBLY MACHINE FOR I.V. COMPONENTS

Robert J. Braber, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 1, 1981, Ser. No. 269,229

Int. Cl.³ B29B *3/00*

U.S. Cl. 156—423 **11 Claims**



1. An apparatus for assembling component parts to lengths of flexible tubing comprising:

a first and a second conveyor member, each said conveyor member defined by a continuous guide path;

means to continuously move each said conveyor;

a frame member supporting said conveyors for rotation over a horizontal axis to provide upper and lower loading and unloading surfaces with said first conveyor supported

above said second conveyor with portions of said conveyors placed in an overlapping manner;

a plurality of oppositely positioned tubing clamp members carried by said first conveyor;

a plurality of commodity carrier members carried by said second conveyor;

means operatively associated with said tubing clamp members to supply predetermined lengths of tubing in said tubing clamp members in a rectilinear manner and in a first plane when said clamp members are positioned at said upper loading surface of said first conveyor;

means operatively associated with said commodity members to position a commodity thereon;

means constructed and arranged in conjunction with said tubing clamp members and said frame member to position the ends of said lengths of tubing in a plane other than said first plane; and

means operatively associated with said tubing clamp members, said commodity carrier members, said conveyor members and said frame member to place at least one end of said tubing when in said other plane in said commodity when said tubing clamp members are in the lower unloading position of said first conveyor and said commodity carrier members are in the upper loading position of said second conveyor.

4,345,964

APPARATUS FOR THE APPLICATION OF A PLIABLE WEB OF MATERIAL ONTO CORRUGATED SHEET

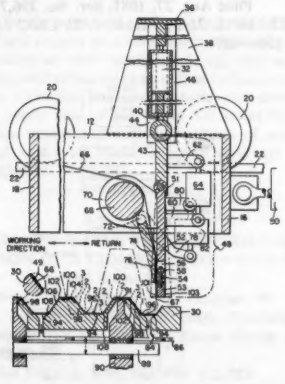
Stig S. W. Scholander, Karlbergsvägen 68 B, S-113 35 Stockholm, Sweden

Filed Oct. 24, 1980, Ser. No. 200,540

Claims priority, application Sweden, Oct. 29, 1979, 7908943

Int. Cl.³ E04C 2/26

U.S. Cl. 156—468 **6 Claims**



5. Apparatus for the application of a pliable web of material such as a thin non-woven web of glass or mineral fibers bonded together at the points of crossing by a glue, on to corrugated sheet, including a rectangular frame open at the top and bottom and having parallel vertical walls, means for supporting the frame above the sheet material to be coated, and means for moving the frame perpendicularly to the extension of the corrugations of the sheet, comprising:

(a) a supporting bar slidably mounted in vertical guidways between two opposite walls of the frame, said supporting bar being carried vertically displaceable via fluidum-operated cylinder-piston assemblies from a beam extending across said frame and rigidly connected to said opposite frame walls; an applicator plate pivotally connected by means of hinges to said supporting bar and suspended therefrom, the bottom edge of said applicator plate being adapted in the course of depositing the web of material to press the free end portion of the web of material firmly to a sheet sprayed with glue, and by coordinated propulsion of the frame by means of said driving means and lifting and lowering of said supporting bar by means of said cylinder-piston assemblies, to follow the corrugations of the sheet for pressing the web of material firmly thereto;

(b) a fluidum-operated cylinder-piston assembly mounted to the supporting bar and applicator plate between brackets for adjusting the angle of inclination of the applicator plate in swinging movements coordinated with the forward movement of the frame and the lifting and lowering movements of the applicator plate;

(c) a guide roller for guiding the web of material into the working area of the applicator plate, said guide roller being rotatably mounted between brackets mounted at the extreme ends of the applicator plate perpendicularly to the surface of said plate on the opposite side of said brackets; and

(d) a material holder pivotally mounted on pivots between the applicator plate and guide roller and obliquely below the latter, said material holder having the shape of an oblong plate extending across the entire width of the web of material, the lower edge of said material holder presenting a beveled knurled surface; a pair of levers rigidly connected to the pivots of the material holder and extending outside the ends of the material holder through the space between said ends and said opposite walls of the frame, a pair of brackets mounted on the opposite flat side of the applicator plate perpendicularly thereto above and in the same plane as said levers, and a pair of fluidum-operated cylinder-piston assemblies pivotally mounted between respective ends of the levers and brackets for swinging the material holder in relation to the applicator plate.

4,345,965

METHOD AND APPARATUS FOR MAKING TWO COMPONENT MOULDINGS

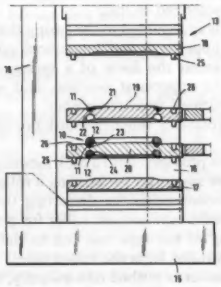
Bernhard Lindenmayer, Hessheim, and Lothar Fink, Achim, both of Fed. Rep. of Germany, assignors to Kloeckner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Aug. 3, 1979, Ser. No. 63,886

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834211

Int. Cl.³ B29C 3/02; B29G 3/00

U.S. Cl. 156—500 **15 Claims**



1. An injection moulding apparatus for manufacturing a composite article of rubber or the like comprising first and second components thermally joined together by vulcanizing or the like, comprising:

(a) a mould press having two substantially parallel, mutually displaceable end plates movable toward each other to close the press and vice versa,

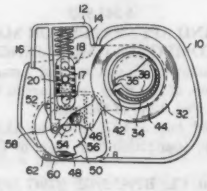
(b) means defining a cavity in a first one of said end plates corresponding to the shape of the first component,
(c) means defining a cavity in a second one of said end plates corresponding to the shape of the second component,
(d) a planar mould plate having a first cavity defined in one surface thereof corresponding to the shape of the first component and a second cavity defined in another, opposite surface thereof corresponding to the shape of the second component,
(e) a planar separator plate,
(f) means for aligning the mould plate and the separator plate between the end plates in a stacked, mutually cooperable, juxtaposed manner to structurally define, upon the closure of the press, three separate mould chambers corresponding respectively to the shape of the first component, the shape of the composite article, and the shape of the second component, and
(g) means for interchanging the relative positions of the mould plate and the separator plate to simultaneously produce separate first and second components and a composite article formed of two previously moulded first and second components during a single closure operation of the mould press.

4,345,966

AUTOMATIC TAPE APPLICATOR

Shigeru Iiyama, No. 13-5, Kamisoshigaya 5-chome, Setagaya-ku, Tokyo; Sinzi Otsu, No. 13-14, Kamiaoki-nishi 2-chome, Kawaguchi-shi, Saitama-ken, and Akio Ooyachi, No. 2292 Hachijo, Yashio-shi, Saitama-ken, all of Japan

Filed Mar. 3, 1981, Ser. No. 240,092
Claims priority, application Japan, Mar. 19, 1980, 55-36817[U]
Int. Cl.³ B32B *31/00*; B44C *7/00*
U.S. Cl. 156—523 **3 Claims**



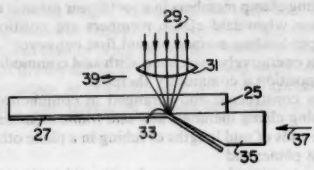
1. An automatic tape applicator for sticking an adhesive tape onto a surface of an object including a casing and a pusher, which is characterized in that:
said pusher is so mounted to the casing that it is reciprocated between uppermost and lowermost positions when it is pushed against the force of a spring urging the pusher toward the uppermost position, and when the pushing force is released from the pusher,
said casing rotatably supports a disk provided with a cutting blade,
said pusher is provided with a rack meshing with teeth of the disk, a tape supporter for holding a rolled adhesive tape, a tape deflection roller for deflecting the tape end downwardly, and a tape support roller for preventing the twist or sagging of the tape end fed to the underside of the deflection roller from the rolled tape,
when the pusher is pushed downwardly, the tape end positioned at the underside of the deflection roller is also downwardly moved and projected from a window formed in the bottom of the casing and is stuck to the surface of the object, and the disk is rotated so as to set the cutter blade on the disk in a cutting preparatory position, and when the pushing force is released from the pusher after the sticking of the tape to the object, the disk is rotated reversely by the rack and the tape is cut at the underside of the deflection roller.

4,345,967

METHOD OF PRODUCING THIN SINGLE-CRYSTAL SHEETS

Melvin S. Cook, 43 Westerly Rd., Saddle River, N.J. 07458

Filed Mar. 4, 1980, Ser. No. 127,114
Int. Cl.³ C30B *33/00*
U.S. Cl. 156—613 **19 Claims**



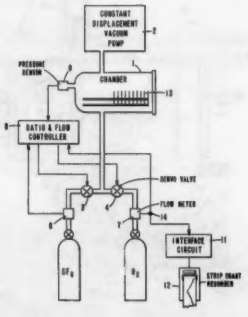
1. A method of producing thin crystals comprising the steps of epitaxially growing an attached layer of crystal on a substrate, said layer of crystal being transparent to radiation of at least one particular wavelength to which said substrate is absorptive in a region of said substrate adjacent the interface of said substrate with said layer of crystal, directing radiation of said at least one particular wavelength into at least part of said absorptive region through said layer of crystal such that material of said at least part but not all of said absorptive region liquifies at the interface of said layer of crystal and substrate, and separating said layer of crystal from said substrate at the liquified material.

4,345,968

END POINT DETECTION USING GAS FLOW

Mary Ellen B. Coe, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 27, 1981, Ser. No. 296,754
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—627 **12 Claims**



1. A plasma etching system comprising:
a plasma etching chamber;
means for sensing the molar content within said chamber;
a source of first etchant gas;
means for coupling said first gas into said chamber;
first means, for regulating the flow rate of said first gas through said means for coupling said first gas;
means for extracting gases from said chamber,
second means, for regulating the flow rate of gases through said means for extracting;
control means, responsive to said means for sensing the molar content, for actuating said first and second means for regulating, so that one means for regulating maintains a substantially constant flow rate while the other means for regulating responds to said means for sensing the molar content; and

means for sensing changes, in the means for regulating which responds to said means for sensing the molar content, to detect the end point of etching.

10. A method for determining the end point of plasma etching, comprising:

coupling a plasma etching chamber to a source of vacuum and a source of etchant gas;

regulating either the inlet gas flow rate or the gas flow rate to said source of vacuum, while holding the other substantially constant, to maintain a fixed molar content within said chamber; and

sensing the time related change of said regulated gas flow during the progression of etching to detect transitions between substantially steady levels.

4,345,969

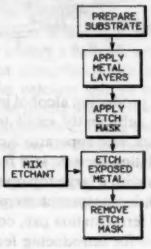
METAL ETCH SOLUTION AND METHOD

Kristi L. James, Phoenix, and A. L. Shields, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 23, 1981, Ser. No. 246,783

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—659.1 **9 Claims**



5. A method for the patterned etching of sequential layers of titanium nickel and copper on a substrate which comprises the steps of: providing an etch mask overlying said sequential layers; immersing said substrate in an etchant solution comprising about 1.8 to 2.0 moles/liter hydrofluoric acid, about 2.5 to 4.0 moles/liter acetic acid, about 8.7 to 9.0 moles/liter nitric acid and balance water; and etching portions of said layers exposed through said mask in said solution until said exposed portions are removed.

4,345,970

PROCESS AND APPARATUS FOR CONTROLLING THE DEPOSITION OF A LIQUID ON TO A MOVING SURFACE

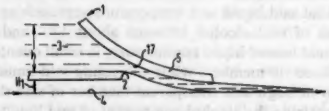
Bronislaw Radvan, Flackwell Heath; Vaughan W. Punton, Beaconsfield, and Paul B. Trendall, High Wycombe, all of England, assignors to The Wiggins Teape Group Limited, Hampshire, England

Filed Feb. 22, 1980, Ser. No. 123,763

Claims priority, application United Kingdom, Feb. 28, 1979, 7907124

Int. Cl.³ D21F *11/04*

U.S. Cl. 162—123 **11 Claims**



1. A process for controlling the deposition of a liquid from a reservoir outlet on to a moving surface, a lower surface of the reservoir outlet being located above and spaced apart from the moving surface, which process includes discharging a jet of the liquid from the outlet on to the underside of a downwardly extending guide member which underside is convex to the jet and is disposed between the outlet and the moving surface, allowing the liquid jet to flow unconstrained down the convex surface of the member on the underside of the member such that a lower surface of the jet is exposed to ambient pressure until the direction of flow of the jet approaches the direction of travel of the moving surfce, depositing liquid on to the moving surface, and maintaining an end of the guide member remote from the reservoir outlet in a predetermined fixed spaced relationship from the moving surface.

11. A process for preparing multilayer paper, which process includes discharging a jet of paper making stock from a headbox slice on to a convexly curved underside of a downwardly extending guide member which is disposed between the slice and a moving wire carrying a paper web disposed below and spaced apart from a lower surface of said slice, allowing the jet of stock to flow unconstrained down the member on the underside such that a lower surface of the jet is exposed to ambient pressure until the direction of flow of the jet approaches the direction of travel of the moving wire, and depositing the liquid on to the paper web to thereby form the multi-layer paper.

4,345,971

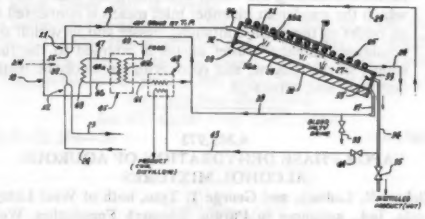
DISTILLATION EMPLOYING HEAT PUMP

W. Keith R. Watson, El Camino Real (Box 1547), Rancho Santa Fe, Calif. 92067

Filed Mar. 13, 1980, Ser. No. 130,143

Int. Cl.³ C02F *1/04*

U.S. Cl. 202—177 **13 Claims**



1. In a heat transfer apparatus, the combination comprising

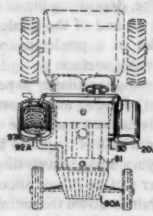
(a) a heat pump having first and second fluid passing portions, the pump operable to transfer heat to distillable fluid in said first portion from coolant in said second portion and from a heat input source,

(b) distillation means having first and second zones at lower and upper sides respectively of a heat transferring barrier plate which is inclined from horizontal, the first zone having an upper section connected with the heat pump first portion to receive heated fluid therefrom for vaporization at said first zone and condensation at the under side of said plate, there being a return line connected between a lower section of said first zone and said heat pump first portion to return concentrate to said heat pump first portion for re-heating, the second zone extending in latent heat receiving proximity to said first zone and via said barrier plate, the second zone connected with the heat pump second portion to circulate heated coolant thereto after transfer of latent heat to said coolant in said second zone, and to return said coolant to said second zone after transfer of heat from the coolant in the heat pump second portion, said heat pump and said distillation means being separate units.

4,345,972
ALCOHOL RECOVERY PROCESS

Tilda M. Hannebaum, and Harold W. Hannebaum, both of P.O. Box H, Shoshone, Id. 83352

Filed Jul. 1, 1980, Ser. No. 164,854
Int. Cl.³ B01D 3/02
U.S. Cl. 203—18 1 Claim



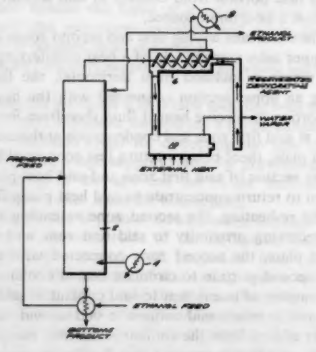
1. A process for producing alcohol, comprising, providing an apparatus, mounted on a vehicle powered by an internal combustion engine, for distillation of alcohol, comprising a vessel for containing mash, means for heating the mash in said vessel to form an alcohol-containing vapor, a condenser coupled to said vessel for condensing said vapor, said condenser being in the form of a hollow double metal walled shaped body formed of an interior metal wall and an exterior metal wall spaced from said interior interior wall and concentric therewith so as to enclose an interior chamber, with both said walls joined together along opposed ends of said walls, and with said condenser shaped to that ambient air may freely flow about the exterior surfaces of both metal walls so as to cool vapors in the chamber to cause said vapors to condense, together with inlet and outlet means connected to said chamber,

in which an exhaust system of said engine serves as the means for heating the vessel containing the mash, and in which the condenser chamber inlet means is connected to an outlet of the mash-containing vessel and in which the condenser chamber outlet means is coupled to the fuel supply of said engine, and recovering an alcoholic distillate from said apparatus.

4,345,973
VAPOR PHASE DEHYDRATION OF AQUEOUS ALCOHOL MIXTURES

Michael R. Ladisch, and George T. Tsao, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West LaFayette, Ind.

Filed Aug. 25, 1980, Ser. No. 181,244
Int. Cl.³ B01D 3/34, 53/04; B01J 20/24; C07C 29/80
U.S. Cl. 203—19 10 Claims

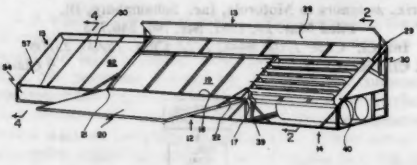


1. A process for the dehydration of aqueous alcohol mixtures and separation of water therefrom which comprises contacting said mixtures while in the vapor state with a dehydration agent selected from the group consisting of cellulose, carboxymethylcellulose, cornmeal, cracked corn, corn cobs, wheat straw, bagasse, starch, hemicellulose, wood chips, other grains, other agricultural residues and mixtures thereof and recovering the alcohol with less than 5% water.

4,345,974
SOLAR PROCESS

Walton W. McCarthy, Box 1091, Bozeman, Mont. 59715

Filed Sep. 15, 1980, Ser. No. 187,348
Int. Cl.³ B01D 3/02
U.S. Cl. 203—19 2 Claims



1. A solar process for producing alcohol including providing an apparatus of a size sufficiently small to be conveniently carried on a flat bed truck, said apparatus including a fermentation section and a distillation section; said fermentation section including a shallow pan with a large top opening inclined at an angle to the horizontal, a transparent member disposed over said top opening of said fermentation pan, cover means for said fermentation pan; means for introducing fermentable material into said fermentation pan, means for removing liquid from said fermentation pan, solar heating means for said liquid, means for transferring said heated liquid to said distillation section; said distillation section including a shallow pan with a large top opening inclined at an angle to the horizontal, said distillation pan including a bottom section with a plurality of spaced rib members, said rib members being disposed in a substantially horizontal, parallel orientation, a transparent member disposed over said top opening of said distillation pan, means for selectively reducing the solar exposure of said distillation pan, liquid collecting means disposed adjacent the lower edge of said distillation pan; and means for controlling the temperatures within said fermentation pan and said distillation pan; said process also including the steps of preparing a pulverized fermentable material, vigorously mixing water with said pulverized fermentable material to form a uniform aqueous mixture including said fermentable material, adjusting the pH of said mixture to between about 4 and 5, selectively exposing said aqueous fermentable mixture to solar radiation in said fermentation section to heat said mixture to an elevated temperature between about 80° and 100° F., maintaining said aqueous fermentable mixture at said elevated temperature for a time sufficient to ferment substantially all of said fermentable material, separating liquid from said fermented mixture, exposing said fermented liquid to solar radiation in said distillation section to heat said liquid to a temperature approaching the boiling point of said alcohol between about 170° and 190° F., passing said heated liquid continuously in small quantities over said inclined rib members while subjecting said liquid to solar radiation through said transparent member of said distillation pan, vaporizing the alcohol component of said liquid, controlling the exposure of said fermented liquid to solar radiation during said vaporizing step, condensing said vaporized alcohol component on the under side of said transparent member disposed closely above said inclined rib members, and collecting said condensed alcohol component.

4,345,975

PROCESS FOR PREVENTING BLOCKAGE IN DISTILLATION COLUMN OF TREATMENT APPARATUS FOR AMMONIACAL WASTE LIQUID

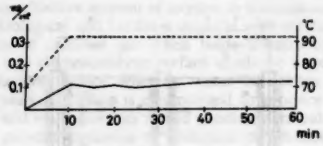
Hideshi Abe, Kurashiki, and Koji Tonooka, Okayama, both of Japan, assignors to Mitsui Kensetsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 31,036, Apr. 18, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,625

Claims priority, application Japan, Sep. 12, 1978, 53-111313; Jan. 30, 1979, 54-8791

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—37 3 Claims



1. In a method for treatment of an ammoniacal waste liquid comprising the steps of effecting a decomposition reaction of fixed ammonia by adding a calcium series alkali so as to obtain a reaction product comprising free ammonia and a calcium salt, separating the calcium salt so as to obtain a separated liquid, and steam-stripping the free ammonia from the separated liquid in a distillation column, the improvement comprising the step of aging the separated liquid in an aging tank for at least 5 minutes at an elevated temperature equal to the temperature at the top of the distillation column immediately prior to the steam-stripping, thus preventing blocking in the distillation column.

4,345,976

PROCESS FOR SEPARATING MIXTURES OF SUBSTANCES OF LOW VOLATILITY

Siegfried Peter, Lange Zeile 138, D-8520 Erlangen, Fed. Rep. of Germany; Gerd Brunner, Roth, and Rolf Riha, Friedelsheim, both of Fed. Rep. of Germany, assignors to Siegfried Peter, Uttenreuth-Weihr, Fed. Rep. of Germany

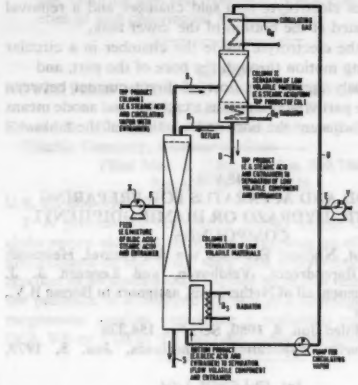
Continuation-in-part of Ser. No. 739,325, Nov. 5, 1976, abandoned, which is a continuation of Ser. No. 632,087, Nov. 14, 1975, abandoned, which is a continuation of Ser. No. 496,871, Aug. 12, 1974, abandoned. This application Feb. 7, 1979, Ser. No. 10,143

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1973, 2340566

Int. Cl.³ B01D *3/36;* C11C *1/10*

U.S. Cl. 203—49 16 Claims

1. A process for substantially separating the components of mixtures of substances at least one of which is of low volatility, while the other is of low or no volatility by using a compressed gas under supercritical conditions, and an entrainer adapted to increase the concentration of said mixtures of substances in the gaseous phase as well as the separation factor between the components to be separated, comprising in combination, feeding such mixture and said entrainer into a first distillation zone, passing said compressed gas upward through said distillation zone, effecting the separation and downward travel of the first component mixed with entrainer, to the bottom of said first distillation zone; passing from the top of said first distillation zone, the compressed gas, entrainer and second component to a point at most as high as the center of a second distillation zone, passing said compressed gas, entrainer and second component upward past a condensing zone at the top of said second distillation zone condensing part of said entrainer so it will travel downward in countercurrent to the compressed gas whereby to substantially free the same from the second component, and to pass to the bottom of said second distillation zone; recycling the compressed gas from the top of the second distillation zone to the bottom of the first distillation zone, recycling part of the bottom product of said second distillation zone to the top of said first distillation zone, whereby to effect substantial separation of said components in the absence of any substantial pressure decrease and the consequent need for recompression.



4,345,977

METHOD AND APPARATUS FOR DEPOSITING METAL IN A LARGE DIAMETER CYLINDRICAL BORE WHICH PASSES THROUGH A LARGE PART

Jacques Blanc, Lyons; Andre Coulon, Bessoncourt, and Gilbert Pellus, Evecquemont, all of France, assignors to Alsthom-Atlantique, Paris and TSM. Traitements de Surface et Mecanique, Vigny, both of, France

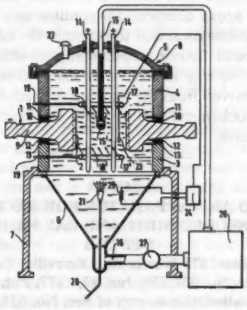
Continuation-in-part of Ser. No. 153,290, May 27, 1980, Pat. No. 4,279,706. This application Apr. 2, 1981, Ser. No. 250,378

Claims priority, application France, Mar. 27, 1980, 80 06834

The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.

Int. Cl.³ C25D *7/04, 17/02, 21/10*

U.S. Cl. 204—26 10 Claims



1. A method of depositing a metal in a large-diameter cylindrical bore which passes through a large part, said method comprising the steps of:

placing the large part centered between an upper tank and a lower tank, said tanks having a common vertical axis of symmetry so that the axis of symmetry of the bore coincides with the axis of the tanks and so that the tanks and the part define a chamber with the bore inside the chamber and the peripheral portions of the part extending outside the chamber,

filling said chamber with electrolyte to the extent of immersing at least the bore of the part within said electrolyte,

causing the electrolyte to flow between a supply tube which discharges electrolyte into said chamber and a removal tube situated at the bottom of the lower tank,

entraining the electrolyte inside the chamber in a circular descending motion through the bore of the part, and

simultaneously applying a flow of direct current between said large part which serves as a cathode and anode means disposed adjacent the bore and coaxially of the tanks.

4,345,978

METHOD AND APPARATUS FOR PREPARING AROMATIC HYDRAZO OR DIAMINODIPHENYL COMPOUNDS

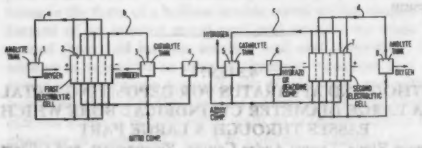
Hans de Groot, Nuenen; Eeuwoud van den Heuvel, Helmond; Embrecht Barendrecht, Veldhoven, and Leonard J. J. Janssen, Nuenen, all of Netherlands, assignors to Borma B.V., Netherlands

Filed Jun. 4, 1980, Ser. No. 156,339

Claims priority, application Netherlands, Jun. 5, 1979, 7904418

Int. Cl.³ C25B *3/04*

U.S. Cl. 204—74 **11 Claims**



1. A method of preparing hydrazo compounds by the electrochemical reduction of aromatic nitro compounds, wherein the reaction is carried out continuously and in two steps, comprising a first step in which the aromatic nitro compounds are reduced to form the corresponding azoxy compounds in a first electrochemical cell, and as the azoxy compounds are produced additional aromatic nitro compound is continuously added to the first electrochemical cell to maintain the concentration of aromatic nitro compound therein substantially constant, and the azoxy compound is continuously removed from the first electrochemical cell to maintain the concentration of azoxy compound therein substantially constant; and subsequently a second step in which the azoxy compounds which have been removed from the first cell are reduced further in a second electrochemical cell to form the corresponding hydrazo compounds.

4,345,979

METHOD AND APPARATUS FOR RECOVERING GEOPRESSURED METHANE GAS FROM OCEAN DEPTHS

Neil L. Carpenter, 175 Nimitz Rd., Kerrville, Tex. 78208

Division of Ser. No. 807,739, Jun. 17, 1977, Pat. No. 4,199,025, which is a continuation-in-part of Ser. No. 624,391, Oct. 21, 1975, Pat. No. 4,037,655, which is a continuation of Ser. No. 462,326, Apr. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 228,846, Feb. 24, 1972, abandoned. This application Apr. 21, 1980, Ser. No. 142,101

Int. Cl.³ C25B *1/00, 9/04*

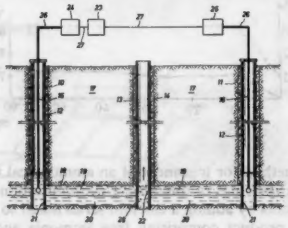
U.S. Cl. 204—101 **9 Claims**

1. A method of recovering geopressured methane dissolved in ocean salt water at a predetermined depth, comprising the steps of

disposing at least two spaced-apart electrodes into electrical contact with the ocean salt water carrying the dissolved methane gas at the predetermined depth, said ocean salt water acting as an electrolyte in contact with said electrodes,

insulating said electrodes from substantially all overlying ocean salt water above a selected depth leaving a selected length of each electrode exposed in electrical contact with the ocean salt water carrying the dissolved methane gas to establish an electrical circuit composed of said electrodes and said salt water electrolyte at said depth containing said geopressured methane,

establishing an AC electrical current flow in said electrodes and said salt water electrolyte at said geopressured methane depth for establishing an AC electrical field surrounding said electrodes for establishing a current density in the ocean salt water carrying the dissolved methane gas in an area surrounding said electrodes exceeding the minimum current density required to cause AC disassociation of saltwater, electrochemically releasing as a free gas said dissolved methane gas and other free gases from said ocean salt water in said area surrounding said electrodes as a function of said current density in said area exceeding said minimum current density and causing AC disassociation of the salt water for allowing said free methane gas to rise to the surface of the ocean, and



recovering said free methane gas at the ocean surface.

4,345,980

ELECTROWINNING OF ZINC

Richard T. Chow; Clifford J. Krauss, and Douwe Ybema, all of Trail, Canada, assignors to Cominco Ltd., Canada

Filed Jun. 12, 1980, Ser. No. 158,711

Claims priority, application Canada, Feb. 19, 1980, 345935

Int. Cl.³ C25C *1/16*

U.S. Cl. 204—119 **4 Claims**

1. In the continuous operation of a process for the electrowinning of zinc comprising leaching zinc-bearing material with spent electrolyte containing sulfuric acid to provide an acid zinc sulphate containing solution; purifying the resulting leach solution to remove undesirable impurities therefrom; incorporating the purified leach solution in the electrolyte in a multiplicity of electrically interconnected cells each containing a plurality of anodes and of cathodes for the deposition of zinc from the electrolyte; recirculating electrolyte overflowing from the cells; returning a portion of the electrolyte circulating through the cells as spent electrolyte to said leaching; periodically removing at least some of the anodes in some of the cells; cleaning or replacing the removed anodes as necessary; returning the fresh or cleaned anodes into the cells from which anodes were removed whereby all of the anodes are periodically removed and replaced during the electrowinning process; the improvement which comprises: returning as spent electrolyte to the leaching process the electrolyte overflowing from only those cells containing at least some replaced or freshly cleaned anodes.

4,345,981

ANODICALLY POLARIZED SURFACE FOR BIOFOULING AND SCALE CONTROL

John E. Bennett, and Joseph E. Elliott, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 963,611, Nov. 24, 1978, Pat. No. 4,256,556. This application Feb. 23, 1981, Ser. No. 237,470
Int. Cl.³ C25B 1/02
U.S. Cl. 204—129 8 Claims

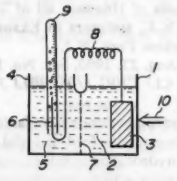
1. A method of maintaining an electrocatalytic electroconductive surface free of at least one of biological and hardness deposits in an aqueous environment containing chloride ions, said electrocatalytic, electroconductive surface being for generating an effective amount of oxygen to maintain said surface free of biological and hardness deposits with substantially no evolution of chlorine gas when made anodic, comprising: making said electrocatalytic surface anodic to a second electroconductive surface whereby water in contact with the electrocatalytic surface is electrolyzed to produce sufficient oxygen and hydrogen ions at said anodic electrocatalytic surface to prevent formation of biological or hardness deposits without the evolution of chlorine, and periodically making the second electroconductive surface anodic to the electrocatalytic surface to effect a removal of at least hardness deposits on the second electroconductive surface.

4,345,982

PROCESS FOR THE PRODUCTION OF HYDROGEN UTILIZING A PHOTOGALVANIC EFFECT OF A POLYACID ION

Tsuneo Ikawa, Kamakura, and Toshihiro Yamase, Yokohama, both of Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,905
Claims priority, application Japan, Mar. 5, 1980, 55-26722
Int. Cl.³ C25B 1/10
U.S. Cl. 204—129 10 Claims



1. A process for the production of hydrogen comprising immersing an anode into an aqueous solution of an alkylammonium salt of polytungstic acid or polyvanadic acid as an anode electrolyte, immersing a cathode into an aqueous solution of an acid as a cathode electrolyte, isolating both said electrolytes from each other, electrically connecting both the electrodes to each other and irradiating a light onto said anode electrolyte, whereby hydrogen is evolved at said cathode.

4,345,983

METHOD FOR DISPOSAL OF CHEMICAL WASTE

Jeffrey K. S. Wan, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed May 21, 1981, Ser. No. 265,798
Int. Cl.³ B01J 19/12
U.S. Cl. 204—158 R 8 Claims

1. A process for disposal of chlorinated hydrocarbons comprising:

effecting intimate contact between a para- or ferromagnetic material surface and a solid or liquid phase chlorinated hydrocarbon;

subjecting said intimately contacted surface to microwave radiations in the range 1.5–3 GHz so as to generate a high intensity oscillating electrical field at said surface and so as to produce, in the presence of a free oxygen containing gas, chloride ions and oxidation products of organic moieties of said chlorinated hydrocarbons.

4,345,984

NOVEL PROSTAGLANDIN ANALOGUES AND PROCESS FOR MAKING SAME

Edward D. Mihelich, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 2, 1981, Ser. No. 239,765
Int. Cl.³ C07C 301/16
U.S. Cl. 204—162 R 8 Claims

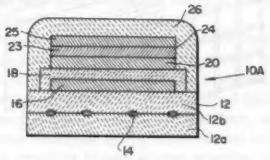
1. A process for converting olefins to the corresponding alpha-epoxy alcohols comprising reacting an olefin with singlet oxygen in the 1 Δg state and converting the reaction product to an alpha-epoxy alcohol by in situ rearrangement in the presence of a catalytic amount of a heterogeneous or homogeneous catalyst containing a transition metal of group IVB, VB or VIB of the Periodic Table, excluding chromium.

4,345,985

METHOD OF PRODUCING SOLID ELECTROLYTE OXYGEN-SENSING ELEMENT OF LAMINATED STRUCTURE

Masayuki Tohda, Yokosuka; Hiroshi Takao, Kamakura, and Shinji Kimura, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1980, Ser. No. 219,841
Claims priority, application Japan, Dec. 26, 1979, 54-168084
Int. Cl.³ B05D 5/12
U.S. Cl. 204—192 EC 18 Claims



1. A method of producing an oxygen sensing element of the concentration cell type, the method comprising the steps of:

preparing a lamination of a shield layer made of a ceramic material, a reference electrode layer laid on a major surface of said shield layer, an oxygen ion conductive solid electrolyte layer formed on said surface of said shield layer such that said reference electrode layer is tightly sandwiched between said shield layer and said solid electrolyte layer and a first measurement electrode layer which has a microscopically porous and gas-permeable structure and is formed on and in close contact with the outer surface of said solid electrolyte layer by applying a wet composition containing fine particles of a metal onto said surface of said solid electrolyte layer, drying the applied composition to evaporate the liquid component of the applied composition and firing the uncompleted lamination to sinter the metal particles contained in the applied composition;

and

forming a second measurement electrode layer having a microscopically porous and gas-permeable structure on the outer surface of said first measurement electrode layer by physical vapor deposition of a metal on said surface of said first measurement electrode layer, wherein said forming of said second measurement electrode layer comprises a first sub-step of performing said physical vapor deposition for a limited time such that the thickness of a metal

film on said lamination during said first sub-step does not exceed 0.5 microns, a second sub-step of subjecting said lamination with said metal film deposited thereon from said first sub-step to a heat treatment performed in air at a temperature in the range from 900° to 1100° C. and a third sub-step of resuming said physical vapor deposition wherein said metal film subjected to said heat treatment becomes an innermost part of said second measurement electrode layer.

2. A method according to claim 1, wherein said second measurement electrode layer is formed so as to have a thickness not greater than 1.0 micron.

6. A method according to claim 2, wherein said second measurement electrode layer is formed by a vacuum evaporation process.

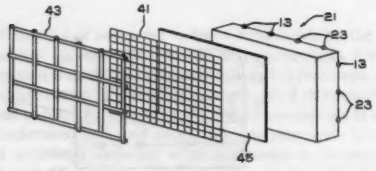
8. A method according to claim 6, wherein the step of forming said second measurement electrode layer further comprises renewing the outer surface of said first measurement electrode layer by sputter-etching in advance of said first sub-step.

4,345,986

CATHODE ELEMENT FOR SOLID POLYMER ELECTROLYTE

Malcolm Korach, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 2, 1980, Ser. No. 155,277
Int. Cl.³ C25B *9/00, 9/04*
U.S. Cl. 204—266 **4 Claims**



1. In an electrolytic cell having an electrolyte impermeable permionic membrane with an anodic portion and a cathodic portion, anodic means removably in contact with the anodic portion, and cathodic means removably in contact with and compressively bearing upon the cathodic portion, the improvement wherein the cathodic means removably bearing upon the permionic membrane comprises a microporous, ductile member, consisting essentially of metallic materials, having a thickness of from about 0.01 millimeter to 1.0 millimeter, chosen from the group consisting of perforated foils and perforated sheets, and conforming to the permionic membrane.

4,345,987

COATED ELECTRODE AND A METHOD OF ITS PRODUCTION

Akira Fukasawa, and Minoru Ueda, both of Ibaragi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,688
Claims priority, application Japan, Apr. 16, 1980, 55-50773
Int. Cl.³ C25B *11/16;* C25C *7/02;* H01M *4/02*
U.S. Cl. 204—290 R **5 Claims**

1. A coated electrode in which lead dioxide is coated on the surface of an alloy which consists of lead and silver.

4,345,988

METHOD FOR SEALING THE DRIVE-SIDE PORTION OF A PREPARATION AND HYDROGENATION CHAMBER FOR HYDROGENATING COAL WITH HYDROGEN TO FORM HYDROCARBONS

Klaus Koch, Laatzen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Division of Ser. No. 151,762, May 21, 1980, Pat. No. 4,287,157. This application Jan. 14, 1981, Ser. No. 225,012
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943538
Int. Cl.³ C10G *1/00;* G10B *47/00;* C10B *47/20, 57/12*
U.S. Cl. 208—8 R **8 Claims**

1. A method of seaing off a drive means for a preparation chamber and a hydrogenation chamber of an apparatus for hydrogenating coal with hydrogen to form hydrocarbons, said chambers being defined by a cylinder containing a rotatable element to convey particles of coal at a first pressure from the preparation chamber into and through the hydrogenation chamber, said method comprising the steps of

(a) continuously feeding a sealing substance in paste form and under pressure from a storage container into a sealing region adjacent to the drive side of said preparation chamber;

(b) maintaining the pressure in said sealing region at a higher pressure than said first pressure prevailing in the adjacent preparation chamber; and

(c) forcing said sealing substance from said sealing region into said preparation chamber due to the force of the pressure differential therebetween, thereby sealing said drive means from said preparation chamber by prohibiting said particles of coal to pass from said preparation chamber into said sealing region.

4,345,989

CATALYTIC HYDROGEN-DONOR LIQUEFACTION PROCESS

Lonnie W. Vernon, Baytown; Lavanga R. Veluswamy; Charles A. Euker, Jr., both of Houston, all of Tex., and Charles A. Mims, Summit, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 27, 1980, Ser. No. 181,602
Int. Cl.³ C10G *1/06;* B01J *37/00*
U.S. Cl. 208—10 **21 Claims**

1. A catalytic hydrogen-donor liquefaction process for converting a solid carbonaceous feed material into lower molecular weight liquid hydrocarbons which comprises contacting said feed material with a hydrogen-donor solvent containing above about 0.6 weight percent donatable hydrogen and a hydrogen-containing gas in a liquefaction zone under liquefaction conditions in the presence of an added carbon-alkali metal catalyst comprising a carbon-alkali metal reaction product prepared by partially gasifying an intimate mixture of carbonaceous solids and an alkali metal constituent with steam in a reaction zone external to said liquefaction zone.

4,345,990

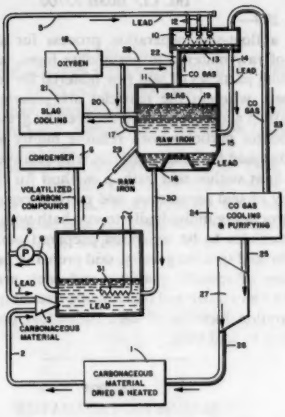
METHOD FOR RECOVERING OIL AND/OR GAS FROM CARBONACEOUS MATERIALS

Per A. H. H. Fahlström, Akersberga, and Karl G. Görling, Lidingö, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE80/00105, § 371 Date Dec. 12, 1980, § 102(e) Date Nov. 5, 1980, PCT Pub. No. W080/02149, PCT Pub. Date Oct. 16, 1980
PCT Filed Apr. 11, 1980, Ser. No. 212,725
Claims priority, application Sweden, Apr. 12, 1979, 7903283
Int. Cl.³ C10G *1/02;* C10B *49/14, 53/06*
U.S. Cl. 208—11 R **12 Claims**

1. A method of recovering volatile constituents from carbonaceous materials by pyrolysis and gasification, whereby the

material is introduced into a first reactor vessel containing a first melt in which volatile constituents are driven off by thermal treatment, and subsequently recovered, and wherein part of the first melt containing the non-volatile constituents of said carbonaceous material is transferred to a second reactor vessel containing a second melt at a temperature greater than the temperature in the first reactor, the first and the second melts being mutually different melts whose solubility in one another is limited and which can be physically separated, and whereby said first and said second melts are brought together to transfer



to and to absorb into said second melt said non-volatile constituents, and wherein one of the members of the group consisting of oxygen, air, and oxides is also introduced into the second melt for gasifying residual quantities of carbonaceous material present in said non-volatile constituents by oxidation; and metal melt from the second reactor vessel is returned to the first reactor vessel in a quantity to substantially maintain the temperature therein and to replace the quantity of the first melt transferred from said first reactor vessel to the second reactor vessel.

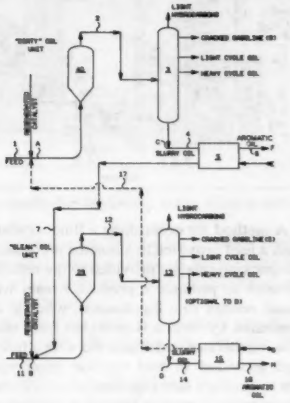
4,345,991

CATALYTIC CRACKING PROCESS

Albert F. Stegelman, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 10, 1980, Ser. No. 214,840
Int. Cl.³ C10G *11/18*
U.S. Cl. 208—78 **6 Claims**

1. In a catalytic cracking process comprising
(a) a first cracking-regeneration loop wherein
(aa) a first feedstock is contacted under cracking conditions with a cracking catalyst in a first cracking zone,
(bb) the cracked first feedstock is withdrawn from said first cracking zone and introduced into a first fractionator,
(cc) a first bottoms slurry is withdrawn from said first fractionator, said first bottoms slurry containing first cracking catalyst fines,
(b) a second cracking-regeneration loop wherein
(aa) a second feedstock is contacted under cracking conditions with a cracking catalyst in a second cracking zone,
(bb) the cracked second feedstock is withdrawn from said second cracking zone and introduced into a second fractionator,
(cc) a second bottoms slurry is withdrawn from said second fractionator, said second bottoms slurry containing a second cracking catalyst fines,
with the proviso that one of said first and second cracking catalyst fines have a relatively high coke content whereas the other one has a relatively low coke content,
the improvement
wherein said first bottoms slurry is passed through a first filter to yield a first oil essentially free of first cracking catalyst fines,
wherein said second bottoms slurry is passed through a second filter to yield a second oil essentially free of second cracking catalyst fines,
wherein said first filter is backflushed by passing at least a portion of said second oil through said first filter to yield a first backflush slurry consisting essentially of said second oil and said first cracking catalyst fines,



wherein said first backflush slurry is passed through said second filter and said second bottoms slurry is also passed through said second filter,
wherein a second backflush fluid being a desirable hydrocarbon feed for said second cracking-regeneration loop is passed through said second filter to yield a second backflush slurry consisting essentially of said second backflush fluid and first and second cracking catalyst fines, and
wherein said second backflush slurry is introduced into said second loop for cracking in said second cracking zone.

4,345,992

CATALYTIC CRACKING PROCESS

Stone P. Washer, and Joe Van Pool, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 27, 1980, Ser. No. 200,646
Int. Cl.³ C10G *47/00, 47/24;* B01J *37/12, 37/18*
U.S. Cl. 208—120 **9 Claims**

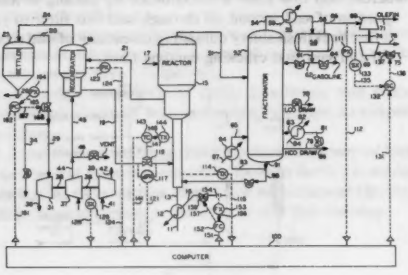
1. In a process for the catalytic cracking of hydrocarbons wherein said hydrocarbons are contacted with particulate cracking catalyst under cracking conditions in a cracking zone, portions of said cracking catalyst are continually transferred to a regeneration zone where carbonaceous materials thereon are consumed by combustion, the thus regenerated catalyst is continually transferred to a reduction zone wherein said catalyst is exposed to a reducing gas under conditions so that the adverse effects of contaminating metals thereon are at least reduced, and the thus reduced catalyst is continually transferred to the cracking zone, the improvement comprising using a gaseous seal upstream of the reducing zone to assure that the major portion of the unconsumed reducing gas passes into the cracking zone.

4,345,993

CONTROL OF A FLUID CATALYTIC CRACKING UNIT

William S. Stewart, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 30, 1980, Ser. No. 221,680
Int. Cl.[3] C10G 11/18; G05D 7/00, 23/00; F27B 15/00
U.S. Cl. 208—164 18 Claims



10. A method for controlling a fluid catalytic cracking unit, wherein a feed provided to a reactor is contacted with a regenerated cracking catalyst provided to the reactor from a catalyst regenerator to produce a product stream which is provided from said reactor to a fractionator, wherein cracking catalyst contaminated by carbon is provided from said reactor to said catalyst regenerator and contacted with a free oxygen-containing gas provided to said catalyst regenerator from an air blower to produce said regenerated catalyst with the resulting hot gases being removed from said catalyst regenerator as a flue gas, and wherein an overhead stream is withdrawn from said fractionator and partially condensed with the uncondensed portion of said overhead stream being provided to the suction inlet of a compressor, said method comprising the steps of:

establishing a first signal representative of the actual suction pressure for said compressor;

establishing a second signal representative of the desired suction pressure for said compressor;

comparing said first signal and said second signal and establishing a third signal responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the speed of said compressor required to maintain the actual suction pressure represented by said first signal substantially equal to the desired suction pressure represented by said second signal;

controlling the speed of said compressor in response to said third signal;

establishing a fourth signal representative of the differential pressure between said catalyst regenerator and said reactor;

establishing a fifth signal representative of the desired differential pressure between said catalyst regenerator and said reactor;

comparing said fourth signal and said fifth signal and establishing a sixth signal responsive to the difference between said fourth signal and said fifth signal, wherein said sixth signal is scaled so as to be representative of the pressure of the flue gas flowing from said catalyst regenerator required to maintain the actual differential pressure between said catalyst regenerator and said reactor represented by said fourth signal substantially equal to the desired differential pressure between said catalyst regenerator and said reactor represented by said fifth signal; and

manipulating the pressure of said flue gas in response to said sixth signal, wherein the suction pressure for said compressor rises when a compressor speed limit is reached to effectively shift loading from said compressor to said air blower by raising the pressure in said catalyst regenerator to maintain a desired pressure differential between said catalyst regenerator and said reactor as the suction pressure for said compressor rises.

4,345,994

METHOD FOR MONITORING THE EFFICIENCY OF RAW MATERIAL BENEFICIATION APPARATUS

Joseph W. Leonard, III, 322 Kenmore St., and Joseph W. Leonard, IV, 1243 Corvette St., both of Morgantown, W. Va. 26505

Filed Dec. 5, 1980, Ser. No. 213,677
Int. Cl.[3] B03B 13/06
U.S. Cl. 209—1 7 Claims

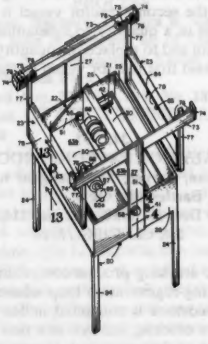
1. In a float-sink separation process for specific gravity sorting of raw material in particulate form, such as coal, by introducing particles of said raw material for separation into a liquid bath wherein the particles are separated within said liquid bath in accordance with the specific gravity of the particles, wherein particles with relative higher specific gravity sink within said bath and particles with relative lower specific gravity float within said bath, a method for determining the efficiency of said separation, said method comprising sequentially introducing individually to said bath with said raw material particulates to be separated prepared particles of determined size and specific gravity, said prepared particles being of a plurality of specific gravities and each prepared particle being of a known size and individually detecting and recording the separation location of each individual prepared particle introduced to said bath.

4,345,995

MAGNETIC SEPARATOR

James H. Ahrendt, E. 12114 Cataldo, #67, Spokane, Wash. 99206

Filed Feb. 20, 1981, Ser. No. 236,588
Int. Cl.[3] B03C 1/06
U.S. Cl. 209—219 8 Claims



1. A machine for separating paramagnetic particles from a particulate mass containing substantially more diamagnetic particles, comprising in combination:

a frame providing a peripherally defined pan support at a spaced distance above a horizontal frame supporting surface;

a processing pan pivotably supported in the pan support in a normally horizontal position but releasably pivotable for dumping;

a spindle plate support having two substantially perpendicularly related spindle plates pivotably mounted on the frame above the pan support in such position that each spindle plate is pivotable to a position substantially parallel to and at a spaced distance above opposite halves of the processing pan, each of said spindle plates having;

a plurality of spacedly arrayed elongate rotatable mag-

netic cylinders extending substantially perpendicularly from its processing pan facing surface, and

means of rotating said cylinder; and

means of removing separated paramagnetic particulate matter from the magnetic cylinders.

4,345,996

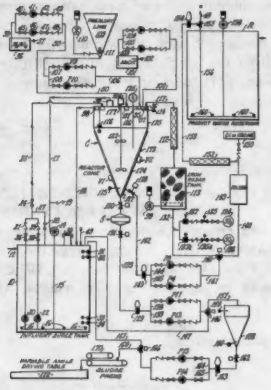
CONIC REACTION CHAMBER FOR WATER DECONTAMINATION

William E. Lindman, Fountain Valley, and John A. Alexander, Cayucos, both of Calif., assignors to Precipitator Corporation, Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 189,339, Sep. 22, 1980, which is a division of Ser. No. 840,414, Oct. 7, 1977, Pat. No. 4,224,148, which is a division of Ser. No. 597,217, Jul. 18, 1975, abandoned. This application Sep. 22, 1980, Ser. No. 189,600

Int. Cl.³ B01D *21/01, 21/24*

U.S. Cl. 210—96.1 **10 Claims**



1. A mixing and reaction chamber particularly adapted for effecting selective stepwise treatment of a flowable, contaminated body of liquid therein, said chamber having multiple inlet means with conduit coupling means for flow coupling respectively to acidic and alkaline reagent supply sources and for introduction of said body of liquid into the chamber,

said chamber having an upper generally cylindrical segment and a lower conic body formed of upwardly outspread, inwardly smooth walls and terminating in a lower generally apical area, said chamber having selective flow control and dual outlet means for separately withdrawing from the contained body of liquid a solid particle component and a supernatent liquid component separated therefrom,

said conic body having means for mixing the body of liquid and additionally having means for selective introduction of gaseous reagents including air into the body of liquid for reaction therewith,

the smooth walls of said conic body including an acid and alkali resistant polymeric-resin liner and an outer support frame including at least one longitudinal anchorage strut disposed inwardly overlying said liner and having power driven vibration means carried by said support frame and fastened to said strut through said liner for accentuating formation and accumulation of solid particles in said apical area in response to introduction of said acidic or alkaline reagents.

4,345,997

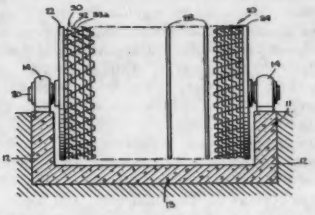
MEDIA

William K. McConnell, Jr., Fort Worth, and Charles M. Campbell, Burleson, both of Tex., assignors to Crane Co., New York, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,794

Int. Cl.³ C02F *3/04*

U.S. Cl. 210—150 **8 Claims**



1. A contactor media for removing waste from water comprising:

at least two mated discs, each disc having parallel raised ribs separated by parallel inverted ribs in an alternating pattern;

each rib having a top surface with a series of uniformly spaced apart recesses therein; and,

each inverted rib having a series of uniformly spaced apart recesses therein on the side of said disc opposite the top surface,

whereby two mated discs have the recesses of the inverted ribs of one disc interfitting with the recesses of the ribs of the other disc, and whereby the two mated discs form crossing chordal channels which provide for the flow of waste water therein and the growth of microorganisms on the surfaces thereof and enhance the transfer of oxygen.

4,345,998

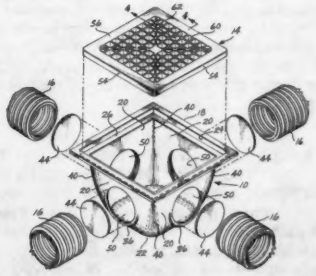
PLASTIC CATCH BASIN

Kelly R. Graffis, 20209 Broadway, Snohomish, Wash. 98290, and Bruce G. Sievert, 18519 - 43rd Pl., Lynnwood, Wash. 99036

Continuation of Ser. No. 55,179, Jul. 5, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,268

Int. Cl.³ E01F *5/00*; E03F *5/06*

U.S. Cl. 210—164 **9 Claims**



1. A thin-wall, monolithic, structural plastic catch basin comprising four side walls meeting at four corners, a bottom, and a top rim formed to include an upwardly opening grate receiving recess;

said top rim extending all the way around said catch basin and comprising a shelf portion which is a horizontal continuation of the side walls of the catch basin and a vertical wall portion

which is an upward continuation of said horizontal shelf portion;

a thin-wall, horizontal plate, constituting an outward continuation of the vertical wall portion of the top rim, including a ground material contacting lower surface;

each said side wall comprising a main panel portion which slopes inwardly as it extends downwardly;

said corners changing gradually in shape, from a small radius, substantially square configuration at the rim to a flatter, substantially wider configuration at the bottom;

each side wall including a generally upright central portion and a crescent shape transition wall interconnected between the lower part of said central portion and the adjoining part of the main panel portion of the side wall;

with said top rim serving as both a receptacle for a grate and as a structural girth beam which strengthens the top of the catch basin;

with the changing shape of the corners of the catch basin at the bottom providing a substantially dome shape attended by dome strength at the bottom of the catch basin; and

with the corners of the catch basin and the transition walls reinforcing the catch basin vertically against buckling under weight placed on the top of the catch basin.

8. A thin-wall, monolithic, structural plastic catch basin comprising four side walls meeting at four corners, a bottom, and a top rim formed to include an upwardly opening grate receiving recess;

each said side wall comprising a main panel portion which slopes inwardly as it extends downwardly;

said corners changing gradually in shape, from a small radius, substantially square configuration at the rim to a large radius rounded configuration at the bottom;

at least one said side wall including a generally upright central portion and a crescent shape transition wall interconnected between the lower part of said central portion and the adjoining part of the main panel portion of the side wall;

with said top rim serving as both a receptacle for a grate and as a structural girth beam which strengthens the top of the catch basin;

with the rounded nature of the corners of the catch basin at the bottom providing a dome shape attended by dome strength at the bottom of the catch basin;

with the corners of the catch basin reinforcing the catch basin vertically against buckling under weight placed on the top of the catch basin;

wherein said side wall central portion includes a drain pipe receiving opening which is bordered all the way around by thin plastic wall material sized to fit within grooved portions of corrugated plastic drain pipe; and

corrugated plastic drain pipe connected to said catch basin, comprising a first rib on the inside of said side wall central portion, a second rib on the outside of said side wall central portion, and a groove between said ribs in which the part of said side wall central portion which immediately borders the drain pipe receiving opening is received, said ribs being larger in diameter than said drain pipe receiving opening.

4,345,999

APPARATUS FOR PREVENTING THE ENTRY OF AIR INTO AN ARTIFICIAL ORGAN

Jan-Erik Sigdell, and Gerd Krick, both of Bad Homburg, Fed. Rep. of Germany, assignors to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie K.G., Apparatebau K.G., Bad Homburg, Fed. Rep. of Germany

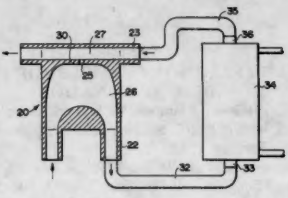
Continuation-in-part of Ser. No. 29,203, Apr. 12, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,378

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818390

Int. Cl.³ B01D *19/00, 31/00*

U.S. Cl. 210—188 **11 Claims**

1. A separator for removing gas from a liquid flow before the liquid flow passes into and through an artificial organ and for returning removed gas back into the liquid flow after the liquid flow has passed from an inlet to an outlet of the artificial organ, comprising inflow channel means (20) for coupling to an inlet of the artificial organ; outflow channel means (27) for coupling to an outlet of the artificial organ, said outflow channel means (27) being positioned over and adjacent to the inflow channel means (20) in its operative position; common wall means (30) joining the inflow channel means (20) and the outflow channel means (27), said common wall means comprising flow resistance means (25) having a low flow impedance for gases and high flow impedance for liquids, said flow resistance means (25) being connectable in parallel to the artificial



organ, whereby gases may pass directly from inflowing liquid back into liquid flowing out of the aritificial organ, thereby passing the artificial organ, said inflow channel means (20) being connectable in series with each other through the artificial organ for generating a pressure drop in said outflow channel means (27) relative to said inflow channel means (20) by liquid flowing out of the artificial organ and through the outflow channel means (27), said pressure drop supporting the withdrawal of gas through said flow resistance means (25) to prevent the entry of gas into an artificial organ.

4,346,000

REACTOR FOR ANAEROBIC PREFERMENTATION OF AQUEOUS WASTE WATERS

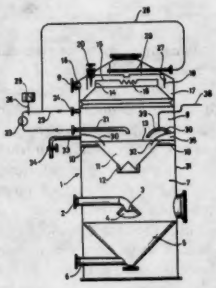
Barend L. van Drooge, Amsterdam, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands

Filed Oct. 27, 1980, Ser. No. 201,078

Claims priority, application Netherlands, Oct. 26, 1979, 7907897

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—195.1 **7 Claims**



1. Reactor for anaerobic prefermentation of aqueous waste waters to be purified by anaerobic fermentation of organic material, said reactor comprising a waste water inlet (2), a liquid outlet (9) for the discharge of prefermented waste water and a sludge outlet (6), the reactor at least comprising one first (7) and one second reactor (8) space being in open connection with each other, the waste water inlet (2) and the sludge outlet (6) debouching into the first reactor space, means (25) for controlling and adjusting the pH in the second reactor (8) space, a centrally suspended annular precipitation cone provided between the first and second reactor space and being connected with the liquid outlet (9) and/or with the second

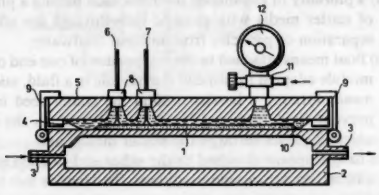
reactor space, through an overflow and a gathering chamber for gathering proteins floating upon the liquids in the first reactor space, said gathering chamber being bounded by a covering sheet extending from the reactor wall into the precipitation cone at a point below the cone's upper edge, while a curved gas escaping tube debouches on the one hand into the gathering space below said covering sheet, and on the other hand, by means of an end to above the upper edge of the cone, said reactor further comprising a floating solids drain line which debouches into the gathering chamber.

4,346,001

LINEAR OVERPRESSURED THIN-LAYER CHROMATOGRAPHIC APPARATUS

Erno Tyihak, Budapest; Emil Mincsovics, Szentendre; Sandor Dios, Budakalasz; Gyula Horvath; Huba Kalasz, both of Budapest; Janos Nagy, Szentendre; Ferenc Körmendi, Budapest; Laszlo Kozma, Budapest; Janos Borsos, Budapest, and Janos Kiss, Budapest, all of Hungary, assignors to Labor Müszeripari Müvek, Esztergom, Hungary

Filed Jun. 12, 1981, Ser. No. 273,209
Int. Cl.³ B01D *19/08*
U.S. Cl. 210—198.3 **1 Claim**



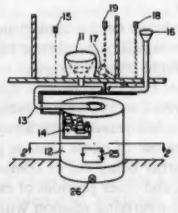
1. Linear overpressured layer chromatographic apparatus comprising a base plate to support a sorbent layer, a cover plate fastenable to the base plate and fitted with a membrane for resiliently clamping down the sorbent layer, means for controlling the introduction of a pressurising between the cover plate and the membrane; and the cover plate is provided with at least one inlet for the mobile phase and at least one sample inlet sealedly passed through the membrane plate.

4,346,002

WATERLESS VACUUM TOILET

Manfred W. A. Petzinger, Rte. 7, Box 87, Elizabethtown, Ky. 42701

Continuation of Ser. No. 72,381, Sep. 4, 1979, abandoned. This application Apr. 3, 1981, Ser. No. 251,023
Int. Cl.³ A47K *11/02*; C05F *9/04*
U.S. Cl. 210—202 **4 Claims**



1. An apparatus for aerobic biological transformation of human waste material comprising:

(a) an aerobic composting compartment for holding said waste during aerobic biological transformation, said compartment having upper inlet and upper outlet means;

(b) a waterless toilet adapted to receive deposited human waste;

(c) a cup-shaped paper receptacle, associated with said waterless toilet, having a cup portion and a cone portion, said cup portion being fabricated from a limited water absorbing material and said cone portion being fabricated from a water absorbing material, means for inserting said cup-shaped receptacle into said waterless toilet prior to depositing said human waste, said cup portion containing said human waste;

(d) a first conduit, coupling said waterless toilet to said composting compartment inlet means, for transporting said cup-shaped paper receptacle containing said human waste from said toilet to said composting compartment, said cone portion wiping said first conduit interior clean as it traverses through said conduit;

(e) vacuum generating means, associated with said first conduit means, for creating a vacuum within said first conduit means thereby transporting said cup-shaped paper receptacle from said toilet to said composting compartment;

(f) funnel means communicating with said first conduit for injecting decomposable garbage, cut grass, weeds, leaves and the like into said composting compartment thereby facilitating the decomposition of said human waste; and

(g) an exhaust conduit, connected to said composting compartment outlet means, for exhausting air and water vapor from said composting compartment; and

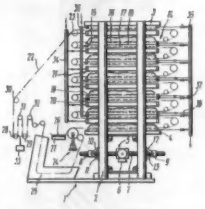
(h) a water vapor separator, associated with said exhaust conduit, for preventing condensed water vapor running back down the interior of said exhaust conduit into said composting compartment.

4,346,003

MASH-SEPARATING FILTER-PRESS

Nikolai F. Polyakov, ulitsa Yabluneva, 24; Leonid M. Ryabchenjuk, ulitsa Entuziastov, 11/1a, kv. 41; Nina A. Emelyanova, ulitsa Sechenova, 3, kv. 56; Georgy T. Sulim, prospekt Mira, 8, kv. 24; Vladimir A. Kobzar, ulitsa Krasnozvezdnaya, 5, kv. 37; Stanislav R. Peresunko, ulitsa Smirnova-Lastochkina, 3/5, kv. 47; Anatoly I. Sokolenko, pereulok Guchny, 2a, kv. 1, and Oleg V. Ivanenko, ulitsa Sechenova, 3, kv. 56, all of Kiev, U.S.S.R.

Filed Nov. 3, 1980, Ser. No. 203,346
Int. Cl.³ B01D *25/12*
U.S. Cl. 210—225 **8 Claims**



1. A mash-separating filter-press comprising:

(a) a framework;

(b) vertical guides mounted on said framework;

(c) a stationary thrust plate horizontally fixed on the upper ends of said vertical guides;

(d) a movable pressure platen horizontally mounted on said vertical guides for movement therealong;

(e) a reciprocating drive mounted on said framework and connected with said movable pressure platen;

(g) a plurality of filter plates horizontally mounted above each other between said thrust plate and said pressure platen for vertical movement along said vertical guides, each said filter plate having:

vertical side boards located on the periphery thereof

having upper and lower butt ends spaced from each other;

a first sieve fixed on the upper butt ends of said side boards;

a second sieve fixed on the lower butt ends of said side boards;

a horizontal partition fixed to said side boards between said sieves and dividing the inner space of the filter plate into an upper cavity and a lower cavity;

(h) a plurality of frames mounted on said vertical guides for vertical movement therealong, each of said frames being situated between vertically adjacent filter plates and defining around the periphery a cavity;

(i) an endless filter band passed in zigzags between said frames and filter plates so that said filter band runs round each said filter plate from above and from below;

(j) a stepping drive mounted on said framework and connected with said endless filter band;

(k) a mash supply collector communicated with the cavities of said frames;

(l) at least one wort withdrawal collector communicated with the upper and the lower cavity of each said filter plate;

(m) a means for supplying and discharging sparge water, communicated with the upper and the lower cavity of each said filter plate through ducts formed in said boards of each filter plate.

4,346,004

SECURING MEANS FOR THE LEAKPROOF MOUNTING OF A SEMI-PERMEABLE MEMBRANE TO A SUPPORT PLATE

Jacques Foucras, Bron, and Georges Rodet, Communay, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 11, 1980, Ser. No. 215,325

Claims priority, application France, Dec. 13, 1979, 79 31187

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—232 **17 Claims**

1. A device for the leaktight securing of semi-permeable membranes to opposite faces and around at least one fluid passage orifice of a membrane support plate of a separatory apparatus, the said device comprising two stamped metal rings which have flanges with means for pressing the edges of said membranes sealingly against the support plate, said rings have generally cylindrical portions which extend into said orifice from opposite ends thereof, one of said rings being a male ring and the other of said rings being a female ring, said cylindrical portions being fixed together in a leaktight manner by a gasket arranged between the rings.

4,346,005

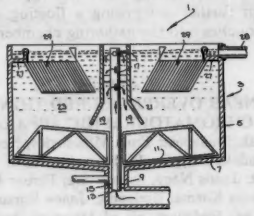
TUBE SETTLER MODULE

Donald R. Zimmerman, Secane, Pa., assignor to Crane Co., New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,581

Int. Cl.³ B01D *21/00*

U.S. Cl. 210—232 **3 Claims**



1. A settler system for use in a circular clarifier having a fluid therein with a center feed inlet and a peripheral launder with an outlet, said system comprising:

(a) a plurality of pie-shaped modules each having a plurality of settler media with passage therethrough for effecting separation of particles from influent feedwater;

(b) float means attached to the top portion of one end of each module adapted to suspend the module in a fluid, said float means forming a barrier around the center feed inlet to prevent fluid from passing from the inlet to the outlet unless it passes through the settler media; and,

(c) hangar means attached to the other end of each module adapted to secure said module to the launder.

4,346,006

DIFFUSION MEMBRANE UNITS WITH ADHERED SEMIPERMEABLE CAPILLARIES

Clinton V. Kopp, Barrington, and Dilip Shah, Gurnee, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 24, 1980, Ser. No. 133,083

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.4 **8 Claims**

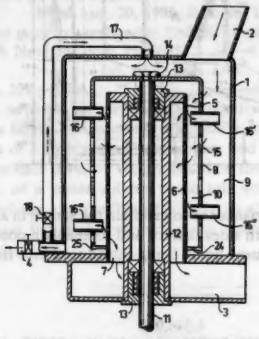
1. A diffusion membrane device comprising a joined plurality of semipermeable capillary membrane tubes comprising, a plurality of planar, single-layered arrays of substantially parallel capillary membrane tubes, said parallel tubes of each of said plurality of single-layered arrays lying in facing contact with at least one adjacent, single-layered, planar array, said plurality of planar arrays defining out of phase sinuous paths, portions of each single-layered array being out of contact with adjoining single-layered arrays, and other portions of each single-layered array being in facing, overlying relation with adjacent single-layered arrays, with the respective capillary membrane tubes of each said single-layered array crossing at an acute angle the tubes of the adjacent single-layered arrays, the crossing tubes of the respective single-layered arrays being adhered to each other, whereby said diffusion membrane device defines a single, unitary structure.

4,346,007

METHOD AT SCREENING APPARATUS FOR CLEANING THE APERTURES IN A SCREEN PLATE AND DEVICE FOR CARRYING OUT THE METHOD

Bo Norman, Johanneshov, and Karl-Johan Grundström, Solna, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Continuation of Ser. No. 17,720, Mar. 5, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,065
Claims priority, application Sweden, Mar. 8, 1978, 7802653
Int. Cl.³ B01D *33/10, 35/16, 45/18*
U.S. Cl. 210—360.1 14 Claims



1. Screening apparatus comprising a cylindrical screen plate having apertures through which a fluid flows in a radial direction so that material dispersed in the fluid collects on the cylindrical surface of the screen plate; and means for producing suction to clean the aperture by removing screened material therefrom, said means including, at least one pumping means mounted in a carrier provided with apertures and rotatable with respect to the screen plate and having the shape of a channel-like nozzle extended radially to the screen plate and having an open inlet end closely facing said surface of the screen plate, and means for moving said carrier and pumping means along a circular path substantially concentric with said cylindrical surface of the screen plate at a velocity which creates suction at said nozzle inlet end sufficient to remove screened material from said cylindrical surface of the screen plate and to conduct the material into and through the pumping means, said apertures in the carrier having a radial extension considerably smaller than said channel-like nozzle to allow recirculation of the main part of the removed material to the screen plate.

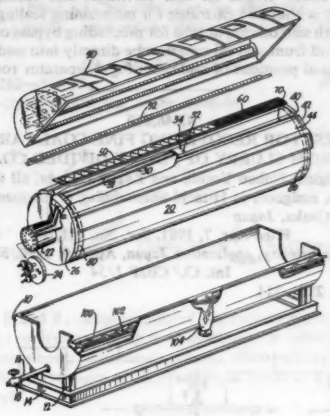
4,346,008

ROTARY DRUM FILTER

Milton D. Leighton, Florham Park, and Douglas G. Ryan, Rockaway, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 15, 1980, Ser. No. 216,447
Int. Cl.³ B01D *33/08*
U.S. Cl. 210—395 14 Claims

1. In a rotary filter means of the type comprising:
(a) a filter vat adapted to contain a filterable liquid-solid slurry;
(b) a rotatable filter drum at least partially disposed in said filter vat and adapted to accept a filter cloth, said drum having circumferential openings therein in substantial alignment with fluid conduits disposed in said drum;
(c) means to rotate said drum in said filter vat;
(d) fluid conduits disposed in said drum in substantial alignment with the circumferential openings in said drum, said conduits communicating with a valve means and with a liquid collection means; and
(e) a valve means communicating with said fluid conduits for regulation of the fluid flow through said conduits and through the circumferentially disposed openings in said filter drum; the improvement which comprises a vented liquid collection means having chambers therein communicating with said fluid conduits said chambers adapted to collect liquid from said fluid conduits during one phase of the rotation of said filter drum and adapted to permit the removal of the liquid during another phase of the rotation of said filter drum.

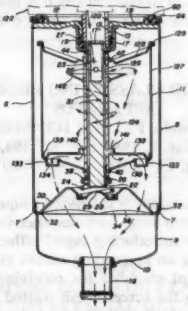


4,346,009

CENTRIFUGAL SPIN-ON FILTER OR SEPARATOR

Willis R. Alexander, Hagerstown, Md., and Robert J. Shaltis, Hastings, Mich., assignors to Hastings Manufacturing Co., Hastings, Mich. and Mack Trucks, Allentown, Pa.

Continuation-in-part of Ser. No. 82,548, Oct. 9, 1979, Pat. No. 4,284,504. This application Jul. 15, 1981, Ser. No. 283,475
The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.
Int. Cl.³ B04B *9/00*
U.S. Cl. 210—512.1 14 Claims



1. An oil separator cartridge comprising a cylindrical spin-on housing having opposite inlet and outlet ends connected by an intermediate wall, said inlet end including a threaded aperture being threadably mountable on an oil output tube having a smooth cylindrical outer end surface, a centrifugal separator rotor unit mounted for rotation and axial reciprocation within said housing for receiving oil from said oil output tube, biasing means urging said centrifugal separator rotor unit toward said inlet with a force of sufficient strength to normally overcome

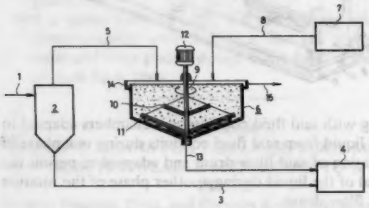
the axial force exerted on said centrifugal separator rotor unit by oil under normal pressure in said oil output tube but permitting said centrifugal separator rotor unit to axially move away from said inlet in response to pressure surges above said normal pressure in said oil output tube so as to cushion the effect of such pressure surges on said cartridge, and sealing means mounted within said cartridge for maintaining sealing engagement with said oil output tube for precluding bypass or leakage flow of oil from said oil output tube directly into said housing for all axial positions of said centrifugal separator rotor unit.

4,346,010

PROCESS FOR RECOVERING FINE COAL PARTICLES FROM SLURRY OF FINELY DIVIDED COAL

Etsuo Ogino; Nobuo Yoshii, and Kazuo Harada, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Apr. 7, 1981, Ser. No. 251,700
Claims priority, application Japan, Apr. 14, 1980, 55-49654
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—714 **6 Claims**



1. A process for recovering fine coal particles from a slurry of finely-divided coal, comprising the steps of:

mixing coarsely divided coal and a binder together to cause the binder to adhere to the surfaces of the coarsely divided coal pieces;

thereafter mixing the slurry of the finely-divided coal with the coal pieces having the binder adhered thereto to cause fine coal particles to adhere to the binder over the surfaces of the coal pieces serving as nuclei so as to thereby form agglomerates; and

subsequently separating the agglomerates from the remaining slurry portion to recover the fine coal particles along with the coarsely divided coal and the binder.

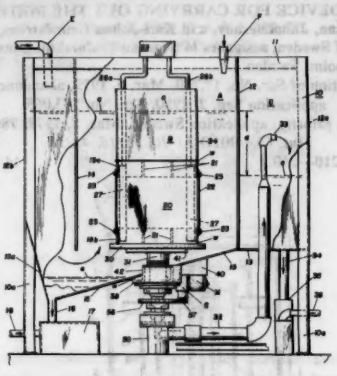
4,346,011

LADEN FLUID CLASSIFYING PROCESS AND APPARATUS

Raymond G. Brownstein, P.O. Box 143, Wexford, Pa. 15090

Filed Sep. 8, 1980, Ser. No. 184,662
Int. Cl.³ B01D *37/00, 35/20*
U.S. Cl. 210—748 **6 Claims**

1. An improved method for clarifying a liquid lading effluent by removing contaminating particles therefrom which comprises, continuously introducing liquid effluent into an outer chamber, employing an upstanding screen mesh to provide a central inner influent chamber for receiving clarified liquid therein, maintaining the screen mesh wetted along both sides thereof, maintaining the liquid effluent at about the viscosity of water at room temperature; applying ultrasonic energy within surrounding liquid closely adjacent to and along substantially the full extent of the screen mesh in such a parallel manner as to prevent the forming of a liquid meniscus and the effective forming of air bubbles within the screen mesh, to retain and agglomerate larger contaminant particles within the outer chamber in a spaced relation with respect to the screen mesh, and to continuously prevent clogging of the interstices of the screen mesh by smaller particles; all while moving clarified influent liquid solely under a slight pressure head and capillary action through the screen mesh into the inner chamber; and during the operation, removing agglomerated aggregate from the outer chamber and clarified influent liquid from the inner



chamber in such a manner as to maintain the screen in a wetted condition along both sides thereof and to enable a continuous clarification of effluent liquid being introduced into the outer chamber.

4,346,012

POWDERY FIRE-EXTINGUISHING AGENT, AND PROCESS FOR ITS PREPARATION

Toshihiko Umaba, Takaishi, and Tadashi Ito, Osaka, both of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo and Miyata Industry Company Limited, Kanagawa, both of, Japan

Filed May 14, 1980, Ser. No. 149,634
Claims priority, application Japan, May 15, 1979, 54-58693
Int. Cl.³ A62D *1/06;* B05D *7/24*
U.S. Cl. 252—7 **4 Claims**

1. A powdery fire-extinguishing agent containing a first powder as main ingredient and a second powder as adjuvant, at least one of said first and second powders being prepared by dipping said powders in a solution or dispersion of an organofluorine compound to adsorb thereon said organofluorine compound and then drying the dipped powders, said organofluorine compound having a fluoroalkyl group containing 3 to 20 carbon atoms, having a major transition temperature of 20° C. or higher, having a fluorine content of 5% by weight or more, being insoluble in water and insoluble or sparingly soluble in a combustible liquid, having oil repellency, being selected from the group consisting of: (i) a homopolymer or copolymer of a vinyl monomer having a fluoroalkyl group containing 3 to 20 carbon atoms; (ii) a mono- or polyester formed between a monohydric or polyhydric alcohol containing 3 to 30 carbon atoms and having a fluoroalkyl group containing 3 to 20 carbon atoms and a mono- or polycarboxylic acid containing 4 to 20 carbon atoms and being optionally fluorinated; (iii) a mono- or polyester formed between a mono- or polycarboxylic acid containing 3 to 20 carbon atoms and having a fluoroalkyl group containing 3 to 20 carbon atoms and a monohydric or polyhydric alcohol containing 2 to 20 carbon atoms and being optionally fluorinated; (iv) a mono- or polyurethane formed between a monohydric or polyhydric alcohol containing 3 to 30 carbon atoms and having a fluoroalkyl group containing 3 to 20 carbon atoms and an organic mono- or polyisocyanate; and (v) a homopolymer or copolymer of an epoxide monomer having a fluoroalkyl group containing 3 to 20 carbon atoms, and being adhered in an amount, based on the treated powdery fire-extinguished agent, of 0.01 to 10% weight to the treated fire-extinguishing agent.

2. The powdery fire-extinguishing agent of claim 1 wherein said powder as main ingredient is selected from the group

consisting of sodium hydrogencarbonate, potassium hydrogencarbonate, ammonium sulfate, ammonium dihydrogen phosphate, potassium chloride, sodium chloride, barites, diammonium hydrogen phosphate, and mixtures thereof with aluminum sulfate and/or aluminum chlorohydrate.

4,346,013

THIXOTROPIC LIQUID AND PROCESS FOR ITS PRODUCTION

Daniel Cadolle, Gland, Switzerland, assignor to BP Chemicals Limited, London, England

Filed Aug. 20, 1980, Ser. No. 179,769

Claims priority, application United Kingdom, Aug. 21, 1979, 7929130; Nov. 24, 1979, 7940673

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 A 10 Claims

1. A process for producing a non-hydraulic thixotropic aqueous liquid which comprises mixing together an aqueous solution of a hydrated cellulose ether and at least 0.05% and not more than 0.4% by weight based on the weight of the total solution of a water soluble ferric salt with an amount of a water-soluble alkali sufficient to give an alkali solution and to make said liquid thixotropic in the absence of a hydraulic substance.

4,346,014

ROLLING OIL COMPOSITIONS AND METHOD OF INHIBITING CARBON SMUT ON BATCH ANNEALED STEEL

Joseph A. Piucci, Royersford, and Kurt Goltz, Exton, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 20, 1981, Ser. No. 255,605

Int. Cl.³ C10M *1/38*

U.S. Cl. 252—47.5 8 Claims

1. In a process for producing steel sheet or strip substantially free of carbon smut deposits from cold rolled steel sheet or strip the improvement comprising cold rolling the steel sheet or strip in contact with a rolling oil containing about 0.5 to 5% by weight of one or more organic nitro-compounds selected from the group consisting of 2,4-dinitro benzoic acid, 2,5-dinitro benzoic acid, 3,4-dinitro benzoic acid, 3,5-dinitro benzoic acid, picric acid, 1,3-dinitro benzene, 2,4,6-trinitro toluene, 3,5-dinitro salicylic acid, 2-amino-6- nitrobenzothiazole, poly glycol ester of 3,5-dinitro benzoic acid, dimethyl octyne diol ester of 3,5-dinitro benzoic acid, 2,4,7-trinitro-9-fluorenone and 1,5-difluoro-2,4-dinitro benzene and thereafter without further treatment batch annealing the steel strip.

4,346,015

METHOD OF IMPROVING ANTIWEAR PROPERTIES OF HIGH TEMPERATURE HYDROCARBON COMPOSITIONS

George S. Somekh, New Rochelle, N.Y., and Robert A. Cupper, Ridgefield, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 13,535, Feb. 21, 1979, abandoned. This application Aug. 14, 1980, Ser. No. 177,969

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—50 4 Claims

1. The method for improving the anti-wear properties of high temperature hydrocarbon composition which comprises adding to said compositions about 0.001 to about 5% by weight of the total composition of at least one arene having 2 or more aromatic rings, selected from the group consisting of acridine, quinoxaline, phthalazine and mixtures thereof.

4,346,016

6-STYRYLQUINOXALINES, AND THEIR USE AS FLUORESCENT BRIGHTENERS

Kurt Burdeska, Basel, and Guglielmo Kabas, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

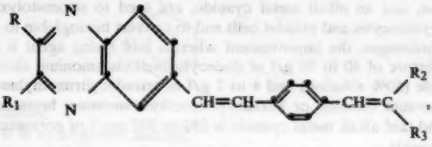
Filed Apr. 16, 1981, Ser. No. 254,822

Claims priority, application Switzerland, Apr. 23, 1980, 3130/80

Int. Cl.³ C07D *403/00*

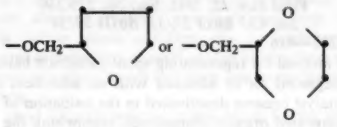
U.S. Cl. 252—301.22 10 Claims

1. A 6-styrylquinoxaline of the formula



in which R and R_1 independently of one another are hydrogen, alkyl, aryl or aryloxy which is unsubstituted or substituted by non-chromophoric substituents, alkoxy, alkoxyalkoxy or phenylthio, R_2 is hydrogen or alkyl and R_3 is cyano or a group of the formula

in which R_4 is alkoxy, alkoxyalkoxy, acyloxyalkoxy,



4,346,017

METHOD FOR CONTROLLING BOILER WATER FOAMING

Thomas E. Cornelius, III, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 19, 1980, Ser. No. 131,583

Int. Cl.³ B01D *19/04*

U.S. Cl. 252—321 3 Claims

1. A method for controlling boiler water foaming which comprises maintaining in said boiler water from 0.1 to 1000 ppm of a boiler water antifoam composition which consists essentially of a vegetable or mineral wax having a saponification number of less than 100; and at least one member selected from the group consisting of chelates, phosphates and phosphonates.

4,346,018

MULTI-PURPOSE BLOOD DILUENT AND LYSING AGENT FOR DIFFERENTIAL DETERMINATION OF LYMPHOID-MYELOID POPULATION OF LEUKOCYTES

James H. Carter, Ft. Lauderdale; Stephen L. Ledis, Hialeah, and Harold R. Crews, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 16, 1980, Ser. No. 159,782

Int. Cl.³ G01N *33/48*

U.S. Cl. 252—408 17 Claims

1. A multipurpose isotonic diluent comprising a mixture of an aqueous solution of:

1. Procaine hydrochloride,
2. N-(2-acetamido)iminodiacetic acid (ADA),
3. Chlorhexidene diacetate,
4. Dimethylolurea,
5. Sodium sulfate and sodium chloride, said diluent being adjusted
   to a pH of 7.0±0.1 with sodium hydroxide or hydrochloric acid solution, as necessary, and
   to an osmolality of 320±5 milliosmoles per kilogram with sodium chloride.

17. In a method of determining leukocytes and hemoglobin in blood wherein a lysing agent containing an aqueous solution of a quaternary ammonium salt having surface active properties, and an alkali metal cyanide, are used to stromatolyze erythrocytes and platelet cells and to convert hemoglobin to a chromagen, the improvement wherein said lysing agent is a mixture of 40 to 70 g/l of dodecyltrimethylammonium chloride (50% solution) and 4 to 7 g/l of tetradecyltrimethylammonium bromide or hexadecyltrimethylammonium bromide, and said alkali metal cyanide is 250 to 500 mg/l of potassium cyanide.

4,346,019

STABILIZATION AND REGENERATION OF ACTIVATED CARBON SUPPORTED PALLADIUM CHLORIDE CATALYSTS IN THE OXIDATION OF VINYL HALIDES

Augustine I. Dalton, Jr., Allentown, and Shivaji Sircar, Wescosville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 22, 1981, Ser. No. 276,240
Int. Cl.³ B01J *27/32;* B01D *53/34*
U.S. Cl. 252—416 **9 Claims**

1. The method for regenerating spent palladium halide catalyst impregnated on or admixed with an adsorbent carbon, which catalyst became deactivated in the oxidation of olefinically unsaturated organic compounds, comprising the step of exposing the spent catalyst to an oxygen-containing inert gas at a temperature in the range of −25° C. to 70° C. for a period of about 16 to 60 days.

2. The method as defined in claim 1 wherein said catalyst is palladium chloride supported on activated carbon.

3. The method as defined in claims 1 or 2 wherein said unsaturated organic compound is an olefinic halide.

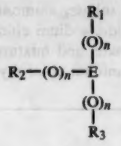
4,346,020

NOVEL CATALYST SYSTEM AND PROCESS FOR PRODUCING ETHANOL USING SAID NOVEL CATALYST SYSTEM

Wayne R. Pretzer; Thaddeus P. Kobylinski, both of Gibsonia, and John E. Bozik, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 42,563, May 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,258, Sep. 5, 1978, abandoned. This application Dec. 29, 1980, Ser. No. 220,427
Int. Cl.³ B01J *31/28, 31/04, 31/02*
U.S. Cl. 252—429 R **21 Claims**

1. A novel catalyst system comprising (1) a cobalt entity selected from the group consisting of a cobalt carbonyl, a hydrido cobalt carbonyl and a cobalt-containing material convertible to a cobalt carbonyl or a hydrido cobalt carbonyl, (2) a tertiary organo Group VA compound of the Periodic Table of the formula:



wherein E is a member selected from the group consisting of trivalent phosphorus, trivalent arsenic and trivalent antimony; and R_1, R_2, and R_3 are either alike or different members selected from the group consisting of saturated or unsaturated, straight or branched chain alkyl radicals having from one to 24 carbon atoms, aryl radicals having from six to 20 carbon atoms; alkenyl radicals having from two to 30 carbon atoms; cycloalkyl radicals having from three to 40 carbon atoms; aralkyl and alkaryl radicals having from six to 40 carbon atoms; and n is an integer of 0 or 1 with the provision that when n is 1, E must be phosphorus, (3) an iodine compound and (4) a ruthenium compound.

4,346,021

METHOD FOR PRODUCING ALUMINOSILICATES, THEIR USE AS CATALYSTS AND SUPPORTS AND METHOD FOR PRODUCING CATALYSTS THEREFROM

William J. Ball, Capel; Keith W. Palmer, Weybridge, and David G. Stewart, Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 968,401, Dec. 11, 1978, Pat. No. 4,242,233. This application Dec. 5, 1980, Ser. No. 213,227
Claims priority, application United Kingdom, Dec. 25, 1977, 53645/77
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.³ B01J *29/06;* C01B *33/28*
U.S. Cl. 252—431 N **18 Claims**

1. A method for preparing a crystalline aluminosilicate having a high silica to alumina molar ratio and an X-ray diffraction pattern substantially the same as that of ZSM-5 zeolite, which method comprises mixing a source of silica, a source of alumina, a source of alkali metal, water and at least one monoalkanolamine selected from the group consisting of monoethanoiamine and monopropanolamine, the ratio of said source of silica to said source of alumina being at least 20:1 based on the equivalent moles of silica and alumina in said respective sources, maintaining said mixture at a temperature above about 120° C. and recovering the crystalline aluminosilicate formed.

4,346,022

METHOD AND APPARATUS FOR PREPARING LEAD-ACID BATTERY PASTES

Edward O. Wolcott, and Frank W. Wentzel, Jr., both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Apr. 13, 1979, Ser. No. 30,039
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—509 **9 Claims**

1. A process for preparing paste mixtures for coating plate grids for use in making lead-acid batteries, the steps comprising feeding a measured quantity of lead powder and a measured quantity of water to a mixer, driving said mixer with a motor wherein the power input to said motor is dependent on the viscosity of material being mixed in said mixer, blending said lead powder and water with said mixer, feeding a measured quantity of dilute sulfuric acid to said mixer, while heating the materials in the mixture to a temperature of between about 140° F. and 160° F., monitoring the power input to said motor for determining the viscosity of paste material in said mixer, mixing said blended lead powder and water with said mixer until the power input to said motor stabilizes, and adding water

to said materials in said mixer until the power input to said mixer stabilizes at a predetermined value, thereby forming the paste mixture.

4,346,023

PROCESS FOR THE PREPARATION OF NOVEL UNSATURATED MACROCYCLIC KETONES

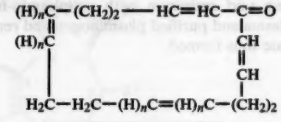
George H. Büchi, and Hans Wüest, both of Cambridge, Mass., assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 76,960, Sep. 19, 1979, Pat. No. 4,302,607, which is a continuation-in-part of Ser. No. 11,685, Feb. 12, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,629

Int. Cl.³ A61K *7/46;* C07C *49/547*

U.S. Cl. 252—522 R 9 Claims

1. An unsaturated macrocyclic ketone of formula



processing two single or two double bonds in the positions indicated by the dotted lines and wherein index n stands for integer 1 or 2.

8. A perfume composition which comprises having added thereto a perfuming effective amount of a compound of formula (I) or of formula (V), as set forth in claim 1 or 4, respectively.

4,346,024

HEAT-STABLE POLYPHASE POLYAMIDE/POLYESTERAMIDE COMPOSITIONS

Jean Coquard, Grezieu La Varenne, and Jean Goletto, Ecully, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 5, 1980, Ser. No. 213,473

Claims priority, application France, Dec. 10, 1979, 79 30649; Mar. 5, 1980, 80 05271

Int. Cl.³ C08L *67/08, 77/02, 77/12*

U.S. Cl. 524—219 12 Claims

1. A heat-stable polyphase polyamido composition of matter having enhanced mechanical properties, comprising (i) from 55 to 99% by weight of a nylon polyamide resin matrix, said polyamide resin having a number-average molecular weight of at least 5,000, and (ii) from 1 to 45% by weight of a particulate disperse phase, which remains differentiated from the polyamide resin matrix both in the solid state and molten state, said particulates having a particle size ranging from 0.01 to 10μ, and said disperse phase comprising a polyesteramide having a content in amide groups of less than 40% of the amide groups comprising said polyamide matrix resin and a glass transition temperature of less than 5° C.

4,346,025

STABILIZED VINYL CHLORIDE POLYMER COMPRISING A PHENYLETHYLIDENE ARYL PHOSPHITE

William E. Leistner, New York, N.Y.; Motonobu Minagawa, Koshigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Kazumi Kitsukawa, Misato, Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

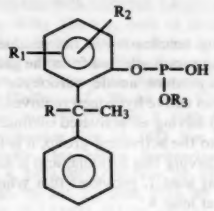
Filed Feb. 7, 1980, Ser. No. 119,547

Claims priority, application Japan, Feb. 7, 1979, 54-13501

Int. Cl.³ C08K *5/52;* C09K *15/32*

U.S. Cl. 524—141 12 Claims

1. A stabilizer composition capable of enhancing the resistance to deterioration in color, clarity, and compatibility of a vinyl chloride polymer composition when heated at 175° C., comprising (A) at least one 6 to 30 carbon atoms phenol salt or 6 to 24 carbon atoms carboxylic acid salt of a polyvalent metal selected from the group consisting of magnesium, calcium, zinc, strontium, barium, cadmium, lead, stannous tin, and dialkyltin, and (B) per part of salt (A) from 0.1 to 10 parts of at least one hydrogen phosphite ester of an ortho-phenylethylidene-substituted phenol having the formula:



(I)

wherein:

R is hydrogen or methyl;

R_1 and R_2 are each selected from the group consisting of alkyl groups having from one to twenty carbon atoms; aryl groups having from six to eighteen carbon atoms; alkaryl and aralkyl groups having from seven to twenty-four carbon atoms; alkylene oxyalkyl groups having from three to forty carbon atoms and from one to twelve oxyether groups; and alkylene oxyaryl groups having from seven to forty-two carbon atoms and from one to twelve oxyether groups;

R_3 is selected from the group consisting of hydrogen; alkyl groups having from one to twenty carbon atoms; cycloalkyl having from five to twenty carbon atoms; aryl groups having from six to eighteen carbon atoms; alkaryl and aralkyl groups having from seven to twenty-four carbon atoms; alkylene oxyalkyl groups having from three to forty carbon atoms and from one to twelve oxyether groups; and alkylene oxyaryl groups having from seven to forty-two carbon atoms and from one to twelve oxyether groups.

12. A vinyl chloride polymer composition having enhanced resistance to deterioration in color, clarity, and compatibility when heated at 175° C., comprising a vinyl chloride polymer and per 100 parts by weight thereof 0.01 to 10 parts by weight of a stabilizer composition according to claim 1.

4,346,026

NON-AGING EPOXY COMPATIBLE SIZE

Robert W. Wong, Granville, and Richard M. Haines, Warsaw, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 30, 1981, Ser. No. 259,132

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—157 5 Claims

1. An aqueous-based size for glass fibers comprising polyvinylacetate and 3-chloropropyl trimethoxysilane.

4,346,027

AIR-DRYING COMPOSITIONS FOR TREATING FIBROUS SUBSTRATES

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 19, 1980, Ser. No. 188,642

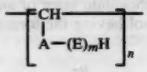
Int. Cl.³ C08K *5/15*

U.S. Cl. 524—377 10 Claims

1. A composition comprising a hydrophilic polymer comprising a plurality of unsaturated linkages that are activated towards oxidative polymerization and a polyol having at least two —OR groups where each R group is —H or —CH_3 provided that at least one such R group is hydrogen, and a carbon to oxygen atom ratio of less than 3:1.

2. A composition according to claim 1 in which the hydro-

philic polymer has a backbone comprising at least one segment with the formula



where A is a moiety terminating in the residue of an active hydrogen-containing group selected from the group consisting of alcoholic hydroxyl, thiol, amide, carboxylic acid and secondary amine with an active hydrogen removed, E is a moiety containing a radical having an activated olefinic unsaturation, either α, β or β γ to the activating group, n is the number of adjacent segments having this formula, and n and m are integers and are each at least 1, provided that where one is less than 4 the other is at least 4.

4,346,028

ASBESTIFORM CRYSTALLINE CALCIUM SODIUM OR LITHIUM PHOSPHATE, PREPARATION AND COMPOSITIONS

Edward J. Griffith, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 153,664, May 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 103,787, Dec. 14, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 209,221

Int. Cl.³ C01B *25/30*

U.S. Cl. 524—417 **15 Claims**

1. Asbestiform, crystalline calcium M phosphate wherein M is sodium or lithium.

9. A process for preparing asbestiform crystalline calcium M phosphate wherein M is sodium or lithium which comprises:

(a) bringing together under reaction conditions a source of oxygen, calcium, phosphorus and M wherein the mole ratios are about 15 mole percent to about 30 mole percent M_2O, about 48 mole percent to about 60 mole percent P_2O_5, and about 20 mole percent to about 37 mole percent CaO to form a melt of a phosphate salt mixture;

(b) maintaining the phosphate salt mixture at a temperature below about the melting point of the calcium M phosphate for a sufficient time to form blocks of calcium M phosphate; and

(c) fiberizing the blocks into said asbestiform crystalline calcium M phosphate.

15. A composite which comprises from about 1 to about 99 percent by weight asbestiform crystalline calcium M phosphate wherein M is sodium or lithium, having an aspect ratio of at least 10:1 and from about 1 to about 99 percent by weight organic polymeric materials.

4,346,029

ANTIPLASMIN AND ANTISERUM

Desire J. Collen, Winksele, Belgium, assignor to Leuven Research & Development V.Z.W., Louvain, Belgium

Division of Ser. No. 775,462, Mar. 8, 1977, Pat. No. 4,198,335. This application Jan. 22, 1979, Ser. No. 5,590

Claims priority, application Netherlands, Mar. 18, 1976, 7602846

Int. Cl.³ A61K *39/395*; C07G *7/00*

U.S. Cl. 260—112 B **3 Claims**

1. A method of preparing an antiserum against antiplasmin, comprising the steps of:

(a) generating an antiserum against plasmin-antiplasmin complex, said generated antiserum containing a plurality of antibodies including antibodies against antiplasmin;

(b) selectively purifying said generated antiserum by removing antibodies other than antibodies against antiplasmin by incubating said antiserum with antiplasmin-free human blood plasma and purified plasminogen and removing the precipitate thus formed.

4,346,030

IMIDAZODIAZEPINE DERIVATIVES

Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach, all of Switzerland; Hanns Möhler, Inzlingen, Fed. Rep. of Germany; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

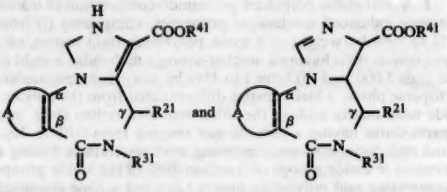
Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839. This application Nov. 16, 1981, Ser. No. 321,491

Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80

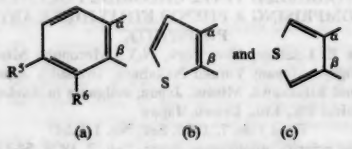
Int. Cl.³ C07D *487/04, 487/14, 513/14*

U.S. Cl. 260—239.3 T **1 Claim**

1. The compounds of the formulas



wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of



the dotted line represents the double bond present in groups (a) and (b), R^{41} is selected from the group consisting of methyl, ethyl and isopropyl and either R^{21} is hydrogen and R^{31} is lower alkyl or R^{21} and R^{31} together are trimethylene or propenylene and the carbon atom denoted as γ has the S- or R,S-configuration.

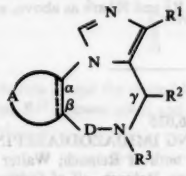
4,346,031

PROCESS FOR PREPARING IMIDAZODIAZEPINES

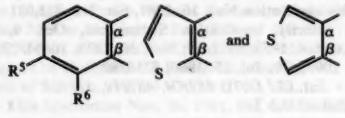
Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach, all of Switzerland; Hanns Möhler, Inzlingen, Fed. Rep. of Germany; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839.
This application Nov. 16, 1981, Ser. No. 321,492
Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80
Int. Cl.³ C07D *487/04, 513/14*
U.S. Cl. 260—239.3 T 1 Claim

1. A process for the manufacture of compounds of the formula



wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of

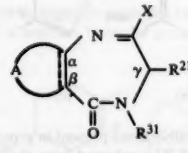


(a) (b) (c)

the dotted line represents the double bond present in groups (a) and (b), D is C═O or C═S, R^1 is selected from the group consisting of cyano, lower alkanoyl and a group of the formula —$COOR^4$, R^4 is selected from the group consisting of methyl, ethyl, isopropyl and 2-hydroxyethyl, R^5 is selected from the group consisting of hydrogen, trifluoromethyl and halogen and R^6 is selected from the group consisting of hydrogen, trifluoromethyl, halogen and lower alkyl and either R^2 is hydrogen and R^3 is hydrogen or lower alkyl or R^2 and R^3 together are trimethylene or propenylene and the carbon atom denoted as γ has the S- or R,S-configuration,

which comprises

reacting a compound of the formula



wherein A and the dotted line are as above, X represents a leaving group, and either R^{21} is hydrogen and R^{31} is lower alkyl, or R^{21} and R^{31} together are trimethylene or propenylene and the carbon atom denoted as has the S- or R,S-configuration,

in the presence of a base with an isocyanoacetic ester of the formula

$CN—CH_2—COOR^{41}$

wherein R^{41} is methyl, ethyl or isopropyl.

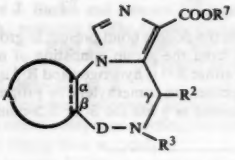
4,346,032

IMIDAZODIAZEPINE DERIVATIVES

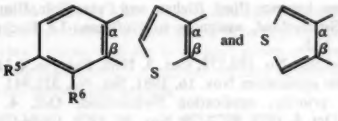
Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach, all of Switzerland; Hanns Möhler, Inzlingen, Fed. Rep. of Germany; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839.
This application Nov. 16, 1981, Ser. No. 321,519
Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80
Int. Cl.³ C07D *487/04, 487/14, 513/14*
U.S. Cl. 260—239.3 T 1 Claim

1. A compound of the formula



wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of



(a) (b) (c)

the dotted line represents the double bond present in groups (a) and (b), D is >C═O or >C═S, R^5 is selected from the group consisting of hydrogen, trifluoromethyl and halogen and R^6 is selected from the group consisting of hydrogen, trifluoromethyl, halogen and lower alkyl and either R^2 is hydrogen and R^3 is hydrogen or lower alkyl or R^2 and R^3 together are trimethylene or propenylene, the carbon atom denoted as γ has the S- or R,S-configuration and R^7 is lower alkyl with the proviso that R^7 is not methyl, ethyl or isopropyl.

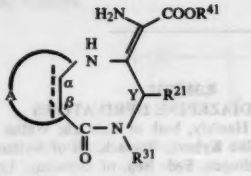
4,346,033

THIENODIAZEPINONE AND BENZODIAZEPINONE INTERMEDIATES

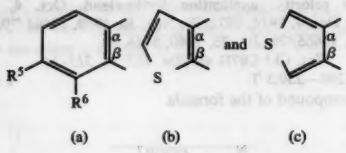
Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach, all of Switzerland; Hanns Möhler, Inzlingen, Fed. Rep. of Germany; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, bot'. of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839.
This application Nov. 16, 1981, Ser. No. 321,821
Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80
Int. Cl.³ C07D *487/04, 487/14, 513/14*
U.S. Cl. 260—239.3 B 1 Claim

1. A compound of the formula



wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of



(a) (b) (c)

the dotted line represents the double bond present in groups (a) and (b), R^{41} is selected from the group consisting of methyl, ethyl and isopropyl and either R^{21} is hydrogen and R^{31} is lower alkyl or R^{21} and R^{31} together are trimethylene or propenylene and the carbon atom denoted as γ has the S- or R,S-configuration.

4,346,034

PROCESS FOR PREPARING IMIDAZODIAZEPINES

Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach; Hanns Möhler, Inzlingen; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

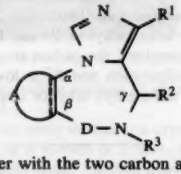
Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839. This application Nov. 16, 1981, Ser. No. 321,941

Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80

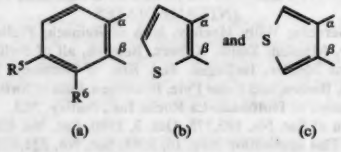
Int. Cl.³ C07D *487/04, 487/14, 513/14*

U.S. Cl. 260—239.3 T **1 Claim**

1. A process for the manufacture

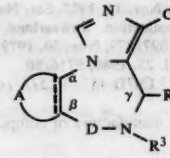


wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of



(a) (b) (c)

the dotted line represents the double bond present in groups (a) and (b), D is C=O or C=S, R^1 is selected from the group consisting of cyano, lower alkanoyl and a group of the formula —$COOR^4$, R^4 is selected from the group consisting of methyl, ethyl, isopropyl and 2-hydroxyethyl, R^5 is selected from the group consisting of hydrogen, trifluoromethyl and halogen and R^6 is selected from the group consisting of hydrogen, trifluoromethyl, halogen and lower alkyl and either R^2 is hydrogen and R^3 is hydrogen or lower alkyl or R^2 and R^3 together are trimethylene or propylene and the carbon atom denoted as γ has the S— or R,S— configuration, which comprises trans-esterifying a compound of the formula



wherein A, the dotted line, D, R^2 and R^3 are as above, and R^7 is lower alkyl.

4,346,035

PROCESS FOR PREPARING IMIDAZODIAZEPINES

Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach, all of Switzerland; Hanns Möhler, Inzlingen, Fed. Rep. of Germany; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

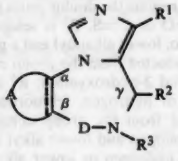
Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839. This application Nov. 16, 1981, Ser. No. 322,031

Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80

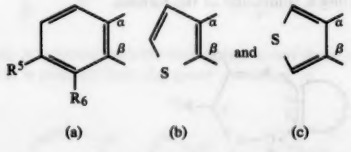
Int. Cl.³ C07D *487/04, 487/14, 513/14*

U.S. Cl. 260—239.3 T **1 Claim**

1. A process for the manufacture

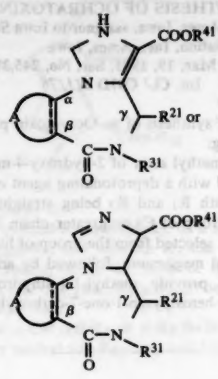


wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of



(a) (b) (c)

the dotted line represents the double bond present in groups (a) and (b), D is >C=O or >C=S,R^1 is selected from the group consisting of cyano, lower alkanoyl and a group of the formula —$COOR^4$, R^4 is selected from the group consisting of methyl, ethyl, isopropyl and 2-hydroxyethyl, R^5 is selected from the group consisting of hydrogen, trifluoromethyl and halogen and R^6 is selected from the group consisting of hydrogen, trifluoromethyl, halogen and lower alkyl and either R^2 is hydrogen and R^3 is hydrogen or lower alkyl or R^2 and R^3 together are trimethylene or propylene and the carbon atom denoted as γ has the S— or R,S-configuration,



wherein A and the dotted line are as above, R^{21} is hydrogen, R^{31} is lower alkyl and R^{41} is methyl, ethyl or isopropyl.

4,346,036

PROCESS FOR PREPARING IMIDAZODIAZEPINE DERIVATIVES

Max Gerecke; Willy Haefely, both of Reinach; Walter Hunkeler, Magden; Emilio Kyburz, Reinach, all of Switzerland; Hanns Möhler, Inzlingen, Fed. Rep. of Germany; Lorenzo Pieri, Riehen, and Petar Polc, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

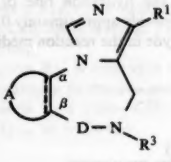
Division of Ser. No. 193,775, Oct. 3, 1980, Pat. No. 4,316,839. This application Nov. 16, 1981, Ser. No. 322,113

Claims priority, application Switzerland, Oct. 4, 1979, 8971/79; Oct. 4, 1979, 8972/79; Nov. 30, 1979, 10664/79; Nov. 30, 1979, 10665/79; Jul. 25, 1980, 5716/80

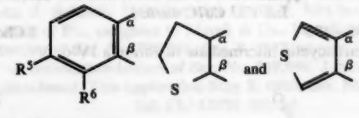
Int. Cl.³ C07D *487/04, 487/14, 513/14*

U.S. Cl. 260—239.3 T **1 Claim**

1. A process for the manufacture of a compound of the formula



wherein A together with the two carbon atoms denoted as α and β is selected from the group consisting of

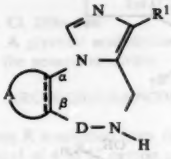


(a) (b) (c)

the dotted line represents the double bond present in groups (a) and (b), D is C=O or C=S, R^1 is selected from the group consisting of cyano, lower alkanoyl and a group of the formula —$COOR^4$, R^4 is selected from the group consisting of methyl, ethyl, isopropyl and 2-hydroxyethyl, R^5 is selected from the group consisting of hydrogen, trifluoromethyl and halogen and R^6 is selected from the group consisting of hydrogen, trifluoromethyl, halogen and lower alkyl and R^3 is lower alkyl

which comprises

alkylating a compound of the formula



wherein A, the dotted line, D and R^1 are as above, at the secondary amino group.

4,346,037

BASE CATALYZED ACYLATION WITH ENOL ESTERS

Howard J. Burke, and Edward J. Hessler, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 10, 1981, Ser. No. 282,314

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239.55 R **16 Claims**

1. In a process comprising acylating an alcohol wherein the improvement comprises reacting the alcohol with an enol ester using a strong base as catalyst.

3. A process for the preparation of a compound having the formula

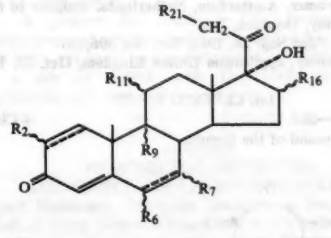
ROAc I

in which R is alkyl, alkenyl, aryl, aralkyl, cycloalkyl, alkyl substituted cycloalkyl, cycloalkenyl, heterocyclic ring or steroidal ring system, and Ac is an acyl group of from 2 to 6 carbons, inclusive, which comprises reacting an enol ester with an alcohol having the formula

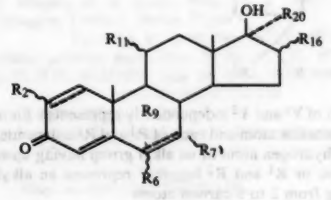
ROH II

wherein R is as defined above, in the presence of a strong base as catalyst.

4. A process according to claim 3 wherein the alcohol includes a steroidal ring system such that the alcohol is selected from the formulae



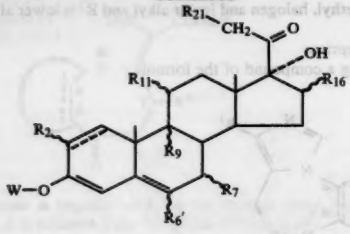
A



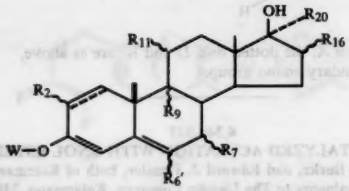
B

-continued

C



D



wherein ~ is α or β; ═ is an optional double bond; R_2 is hydrogen or halo wherein halo is fluoro, chloro, or bromo; R_6 is hydrogen, halo; wherein halo is fluoro, chloro, or bromo, methyl or methylene with the proviso that if there is a double bond between the 6 and 7 position R_6 is limited to hydrogen, methyl, or halo; W is alkyl of from one to 5 carbons, inclusive, and R_6' is hydrogen, methyl or halo; wherein halo is fluoro, chloro or bromo; R_7 is hydrogen or methyl; R_9 is hydrogen or fluoro; R_{11} is hydrogen, OX or keto or R_9 and R_{11} taken together are a β-epoxide or a double bond; R_{16} is hydrogen or methylene, methyl or OX; R_{20} is hydrogen, methyl, allenyl or —C═C—Z wherein Z is hydrogen or alkyl of from one to 5 carbon atoms, inclusive; R_{21} is H, halo or OX; wherein X is hydrogen, trimethylsilyl, or —CO—Y, wherein Y is lower alkyl or phenyl.

6. A process according to claim **4** wherein the alcohol is 17α-hydroxy-6-α-methyl-9β,11β-oxido-pregna-1,4-diene-3,20-dione.

4,346,038

OXABICYCLO[3.1.0]HEXAN-2-ONES

Petrus A. Kramer, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

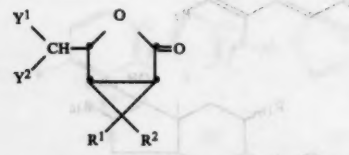
Filed Sep. 28, 1981, Ser. No. 306,106

Claims priority, application United Kingdom, Oct. 22, 1980, 8034067

Int. Cl.³ C07D *307/93*

U.S. Cl. 549—302 **4 Claims**

1. A compound of the formula



(I)

wherein each of Y^1 and Y^2 independently represents a fluorine, chlorine or bromine atom and each of R^1 and R^2 independently represents a hydrogen atom or an alkyl group having up to 10 carbon atoms, or R^1 and R^2 together represent an alkylene group having from 2 to 5 carbon atoms.

4,346,039

SYNTHESIS OF OCHRATOXINS

George A. Kraus, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Mar. 19, 1981, Ser. No. 245,382

Int. Cl.³ C07D *311/76*

U.S. Cl. 549—289 **10 Claims**

1. A method of synthesis of an Ochratoxin precursor compound, comprising:

reacting the dimethyl ester of 2-hydroxy-4-methylbenzene-1,3 dioic acid with a deprotonating agent of the formula: R_1R_2NM, with R_1 and R_2 being straight or branched chain alkyl group of C_2 or greater chain length, and M being a metal selected from the group of lithium, sodium, potassium and magnesium, followed by addition of acetadehyde to provide methyl-1,4-dihydro-8-hydroxy-3-methyl-1-H-2-benzopyran-1-one-7-carboxylate.

4,346,040

PROCESS FOR CONVERTING AN ALDEHYDE INTO AN ALKENE, IN PARTICULAR FURFURAL INTO FURFURYLIDENES

Michel Delmas, Entraygues; Antoine Gaset, Toulouse, and Yves Le Bigot, Saint Martin de Londres, all of France, assignors to Agrifurane S.A., Bon Encontre, France

Filed Jul. 21, 1981, Ser. No. 285,488

Claims priority, application France, Jul. 28, 1980, 80 16767

Int. Cl.³ C07D *307/28*

U.S. Cl. 549—505 **11 Claims**

1. In a process for converting an aldehyde into a corresponding alkene, wherein the aldehyde is placed in the presence of a phosphonium salt and a base in the solution of an aprotic organic solvent, for obtaining an alkene substituted or not in alpha or beta of the carbon of the ethylenic double bond obtained from the phosphonium salt by a cyclic or an aliphatic chain and not substituted from the same carbon by a heteroatom or a heteroatomic functional group, the improvement comprising using as said base a compound selected from the group consisting of (i) mineral bases which in aqueous medium produce a basic strength less than or equal to the basic strength of the hydroxide ion and (ii) organic bases of the nitrogen compound family, and adjusting the hydration rate of the organic reaction medium so as to provide approximately 0.5 to 5 moles of water per mole of aldehyde in the reaction medium.

4,346,041

COMPOSITION AND PROCESS

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

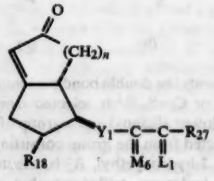
Continuation-in-part of Ser. No. 125,608, Feb. 28, 1980, Pat. No. 4,338,457. This application Dec. 22, 1980, Ser. No. 219,198

Int. Cl.³ C07C *49/633*

U.S. Cl. 549—498 **1 Claim**

1. The carbacyclin intermediate of formula IV or V:

IV



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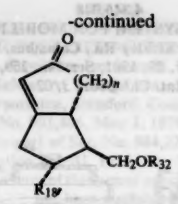


V

wherein n is one or 2;

wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, and wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein M_6 is α-OR_{10}:β-R_5 or α-R_5:β-OR_{10}, wherein R_5 is hydrogen or methyl and R_{10} is an acid hydrolyzable protective group;

wherein R_{27} is

(1) $—C_mH_{2m}—CH_3$, wherein m is an integer from one to 5, inclusive,

(2) phenoxy optionally substituted by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3-)alkoxy, with the proviso that not more than two substituents are other than alkyl, with the proviso that R_{27} is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different,

(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3-)alkoxy, with the proviso that not more than two substituents are other than alkyl,

(4) cis—CH=CH—CH_2—CH_3,

(5) $—(CH_2)_2—CH(OR_{10})—CH_3$, wherein R_{10} is as defined above, or

(6) $—(CH_2)_3—CH=C(CH_3)_2$;

wherein —C(L_1)—R_{27} taken together is

(1) (C_4–C_7)cycloalkyl optionally substituted by one to 3 (C_1–C_5)alkyl;

(2) 2-(2-furyl)ethyl,

(3) 2-(3-thienyl)ethoxy, or

(4) 3-thienyloxymethyl;

wherein R_{18} is hydrogen, hydroxy, hydroxymethyl, —OR_{10} or —CH_2OR_{10}, wherein R_{10} is an acid-hydrolyzable protective group;

wherein R_{32} is hydrogen or R_{31}, wherein R_{31} is a hydroxyl hydrogen protective group; and

wherein Y_1 is trans—CH=CH—, cis—CH=CH—, —CH_2-CH_2—, or —C≡C—.

4,346,042

PREPARATION OF EPIHALOHYDRIN ENANTIOMERS

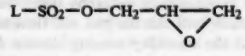
John J. Baldwin, Lansdale, and David E. McClure, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 940,681, Sep. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 919,590, Jun. 27, 1978, abandoned. This application May 5, 1980, Ser. No. 146,927

Int. Cl.³ C07D *303/34*

U.S. Cl. 549—557 **2 Claims**

1. An (R) or (S) isomer of a compound of the formula



wherein L is CF_3.

4,346,043

ANTIMICROBIAL GLYCOLIC ACID DERIVATIVES

August V. Bailey, New Orleans; Gordon J. Boudreaux, Metairie, and Gene Sumrell, New Orleans, all of La., assignors to The United States of America as represented by the United States Department of Agriculture, Washington, D.C.

Filed Feb. 19, 1981, Ser. No. 235,812

Int. Cl.³ C09F *5/00*

U.S. Cl. 260—404 **5 Claims**

1. A glycolic acid derivative having antimicrobial activity and the general structure:

$$(RCOOCH_2CH_2)_2NCOCH_2OOCR$$

where R is selected from the group consisting of an alkyl and alkenyl of 4 to 17 carbon atoms and may be branched or unbranched.

4,346,044

WATER-SOLUBLE AIR-DRYING ALKYD RESINS, PROCESS FOR THEIR PREPARATION AND THEIR USE AS BASES FOR NON-YELLOWING LACQUERS

Rolf Dhein; Jochen Schoeps, and Rolf Küchenmeister, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,558

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930734

Int. Cl.³ C09D *3/64*

U.S. Cl. 260—404.8 **12 Claims**

1. Water-soluble, air-drying, amine-neutralised alkyd resins having fatty acid contents of 20–60% obtained from reactants comprising dicarboxylic acids or their ester-forming derivatives, polyhydric alcohols, fatty acids, and semi-ester-forming dicarboxylic acid anhydrides, characterised in that 10–80% by weight of the fatty acids are fatty acids with conjugated double bonds and the semi-ester-forming dicarboxylic acid anhydride is hexahydrophthalic acid anhydride.

4,346,045

PROCESS FOR RESOLVING DL-S-BENZOYL-β-MERCAPTOISOBUTYRIC ACID, AND PRODUCTS OBTAINED

Nicolaas A. De Heij, Venlo, Netherlands, assignor to Oce-Andeno B.V., Venlo, Netherlands

Filed Mar. 3, 1981, Ser. No. 239,899

Claims priority, application Netherlands, Mar. 6, 1980, 8001341

Int. Cl.³ C07C *153/07*

U.S. Cl. 260—455 R **4 Claims**

1. A process for resolving DL-S-benzoyl-β-mercaptoisobutyric acid which comprises treating said acid in solution with D-(+)-N-benzyl-α-phenethylamine (NBPA), thus forming a salt of NBPA with D-(−)-S-benzoyl-β-mercaptoisobutyric acid, and isolating said salt.

4,346,046

PROCESS FOR PRODUCING AMINOARYL-β-SULFATOETHYLSULFONE

Nobuzi Nishimura, Toyonaka; Utazi Sawa; Takemi Tokieda, both of Nara; Shun-ichi Hayakawa, and Yasuo Tezuka, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 16, 1980, Ser. No. 169,497

Claims priority, application Japan, Jul. 19, 1979, 54-92201; Aug. 9, 1979, 54-102075; Aug. 14, 1979, 54-103656

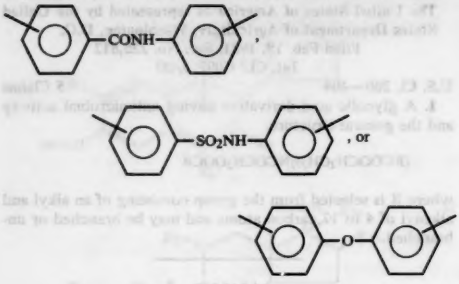
Int. Cl.³ C07C *141/16*

U.S. Cl. 260—458 C **6 Claims**

1. A process for producing a sulfuric acid semiester of the formula (I):

$$NH_2—A—(SO_2CH_2CH_2OSO_3H)_n \quad (I)$$

wherein A is phenylene, naphthylene,



which may be substituted with one or two methyl, methoxy, hydroxy, chloro, carboxylic or sulfonic acid groups and n is an integer of 1 or 2, which comprises subjecting a mixture of an acid and a compound of the formula (II-1) or (II-2):

$$NH_2—A—(SO_2CH_2CH_2OH)_n \quad \text{(II-2):}$$

$$B—NH—A—(SO_2CH_2CH_2OH) \quad \text{(II-2)}$$

wherein A and n are as defined above and B is a group capable of being hydrolyzed by an acid, to reaction, while removing a volatile matter from the reaction system, in a reaction zone capable of removing the volatile matter by azeotropy with an organic solvent, evaporation or vaporization, whereby esterification of said compound of the formula (II-1) or hydrolysis and esterification of said compound of the formula (II-2) is effected, the acid in the reaction system being sulfuric acid and the amount of the acid being 1 to 2 moles per mole of β-hydroxyethylsulfonyl group in the compound of the formula (II-1) or (II-2).

4,346,047

PRODUCTION OF PHOSGENE

Herbert Riegel, Maplewood, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Oct. 2, 1978, Ser. No. 947,604
Int. Cl.³ C07C *51/58*
U.S. Cl. 260—544 K **17 Claims**

1. A process for producing phosgene, comprising:

(a) contacting a molten salt mixture containing the higher and lower valent chlorides of a multivalent metal with hydrogen chloride and oxygen to enrich the salt in the higher valent metal chloride;

(b) contacting the molten salt from step (a) with carbon monoxide to strip gaseous chlorine from the salt and produce phosgene by reaction with carbon monoxide, said contacting being effected to recover essentially all of the chlorine values added in step (a) as phosgene and chlorine; said contacting being effected under a vacuum, with the carbon monoxide being employed in about stoichiometric proportions to chlorine values added to the molten salt in step (a);

(c) passing molten salt from step (b) to step (a); and

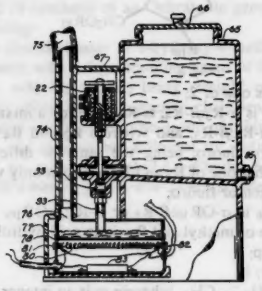
(d) recovering a gaseous effluent from step (b) containing carbon monoxide, stripped chlorine and phosgene, said carbon monoxide and chlorine being present in the effluent in about stoichiometric proportions for phosgene production.

4,346,048

HUMIDIFYING SYSTEM FOR MOBILE VEHICLES

James T. Gates, 1611 Kirkley Rd., Columbus, Ohio 43221

Filed Apr. 29, 1981, Ser. No. 258,642
Int. Cl.³ B60H *3/02*
U.S. Cl. 261—130 **4 Claims**



1. Apparatus for controlling the humidity of the passenger compartment of a vehicle, said compartment including a conventional cigar lighter outlet comprising, in combination:

a container for holding water, said container including an upper opening for filling purposes and two lower openings for discharge purposes,

when in operative condition:

(a) the upper opening being closed by a lid which seals the container in fluid tight condition,

(b) the first of said lower openings being a drain opening having means therein to prevent both water from discharging and air from entering, and

(c) the second of said lower openings leading into a passage, said passage including a valve seat, a valve member for sealing against said seat in fluid tight arrangement, said valve member being mounted on a common stem with a reciprocal plunger, said plunger being a part of an actuator,

said actuator being controlled by a humidity sensing device and powered by electrical current from a plug inserted into said cigar lighter outlet, said humidity sensing device being connected in series with said actuator and with an electric heater whereby the opening of said passage by said actuator also switches the heater to the on position,

a spigot leading from the passage downstream of the valve seat to a terminus within a heater pan, the heater being disposed to heat the water in the pan when the valve member is in the open position,

the passage, spigot, and valve member being configured to allow water to flow by gravity from the container to the pan and air to flow from said pan area to the container to relieve the vacuum formed by the discharge of water from the fluid tight container when said valve member is in open position,

the spigot extending into the area of the pan below the upper level thereof whereby the water will rise above the level of the spigot terminus before the pan overflows to thereby stop the discharge of water from the container since no air can enter the spigot to relieve the vacuum within the container,

a vapor duct leading from the pan to the interior of the passenger compartment whereby water vapor generated by said heater will exit the pan and flow to the compartment until the humidity sensing device deactivates the electrical system when a predetermined humidity level has been reached in the compartment.

4,346,049

SINTERED ALPHA SILICON CARBIDE CERAMIC BODY HAVING EQUIAXED MICROSTRUCTURE

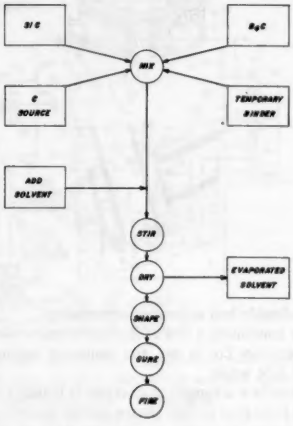
John A. Coppola, Lewiston; Laurence N. Hailey, Niagara Falls, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 901,406, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 584,226, Jun. 5, 1975. This application Jul. 31, 1978, Ser. No. 930,435

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.[3] *C27B 9/04*

U.S. Cl. 264—65 36 Claims



1. A process for producing a sintered alpha silicon carbide ceramic body having equiaxed microstructure, comprising the steps of:

(a) mixing together a mixture comprising the components:

(i) from about 91 to about 99.85 parts by weight silicon carbide powder comprising at least 95% by weight alpha, non-cubic crystalline silicon carbide and having a surface area of from about 1 to about 100 m^2/g;

(ii) from about 0.67 to about 20 parts by weight of a carbonizable organic material having a carbon content of at least 33% by weight;

(iii) from about 0.15 to about 5 parts by weight of a boron source containing from about 0.15 to about 3.0 parts by weight boron;

(iv) up to about 15 parts by weight of temporary binder; and

(v) from about 25 to about 100% by weight of the silicon carbide powder, carbonizable organic material, boron source and temporary binder of a solvent in which the carbonizable organic material is soluble; said mixing being done in such a way as to disperse the carbonizable organic material about the silicon carbide powder and coat the silicon carbide powder therewith;

(b) drying the mixture in such a way as to evaporate the solvent from the mixture;

(c) shaping the dried mixture in such a way as to produce a shaped body having a density of at least about 1.60 g/cc; and

(d) firing the shaped body under such conditions of time, temperature and atmosphere as to obtain a density of at least about 2.40 g/cc and an equiaxed microstructure, said temperature being between about 1900° C. and about 2250° C.

4,346,050

POLYMER CONCRETE HAVING LOW BINDER LEVELS

Peter F. Trent, Westmount, and Raymond Charlebois, Laval Sur-le-Lac, both of Canada, assignors to Plastibeton Canada Inc., Montreal, Canada

Continuation-in-part of Ser. No. 119,259, Feb. 7, 1980, abandoned, which is a continuation of Ser. No. 44,141, May 31, 1979, abandoned, which is a continuation of Ser. No. 918,196, Jun. 22, 1978, abandoned. This application Dec. 17, 1980, Ser. No. 217,498

Int. Cl.[3] *B28B 1/08*

U.S. Cl. 264—71 28 Claims

1. A process for preparation of a polymer bonded concrete of less than 10% by weight organic binder which comprises

(1) mixing an aggregate containing sand, stone or gravel or mixtures thereof with, as binder components,

(a) at least one material selected from the group of α, β-ethylenically unsaturated monomer and an unsaturated polyester dissolved in at least one of said α, β-ethylenically unsaturated monomer, the solution of monomer and polyester being of low viscosity and containing monomer in excess of that required for crosslinking purposes, and wherein said α,β-ethylenically unsaturated monomer is selected from the group of styrene, styrene derivatives, C_{1-18} alkyl esters of acrylic acid, C_{1-8} alkyl esters of methacrylic acid, divinyl benzene, and mixtures thereof; and

(b) a free radical polymerication initiator, to form a mixture of aggregate with binder components;

(2) casting the mixture;

(3) subjecting the mixture to intense vibration, wherein the vibration is sufficiently intense to cause segregation of aggregate from binder and to cause a layer of excess liquid binder to form on the upper surface of the cast mixture, and

(4) allowing the monomers to polymerize and set to produce the polymer bonded concrete.

4,346,051

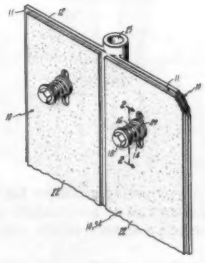
METHOD OF PRESS FORMING A ZEOLITE ARTICLE

David J. McFarlin, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 16,263, Feb. 28, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,161

Int. Cl.[3] *B29J 5/00*

U.S. Cl. 264—102 2 Claims



1. The method of forming a zeolite article useful for cryoadsorption which comprises

(a) pressing dry zeolite powder of a pore size between $2\text{–}25\times10^{-10}$ m without a binder at a pressure of at least 10 MPa (1.5 ksi), to form a preform;

(b) sealing the preform within a flexible container;

(c) evacuating the container; and

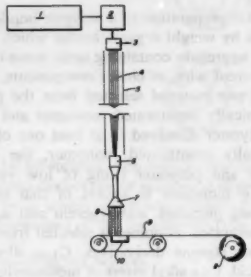
(d) isostatically pressing the preform in the container at a pressure of 200–500 MPa (29–80 ksi), to compact the article.

4,346,052

PROCESS FOR HOMOGENEOUS CURLY SYNTHETIC POLYMER FIBERS

Jack R. Knox, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 909,161, May 24, 1978, Pat. No. 4,241,002, which is a division of Ser. No. 712,845, Aug. 9, 1976, abandoned.
This application Jul. 31, 1980, Ser. No. 174,200
Int. Cl.³ B28B *3/20*
U.S. Cl. 264—176 F 2 Claims



1. A method of increasing the crystallization temperature range of a stereospecific polymer consisting essentially of extruding at a temperature between about 200° C. and about 325° C. a mixture of said stereosymmetric polymer and an organic compound, said organic compound having at least one bromine labile in the temperature range about 200° C. to about 325° C.

4,346,053

PROCESS FOR MELT-SPINNING HOLLOW FIBERS

Ronald E. Pfeiffer, Pensacola, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 13,353, Feb. 21, 1979, Pat. No. 4,278,415.
This application Mar. 2, 1981, Ser. No. 239,257
Int. Cl.³ D01D *5/24*
U.S. Cl. 264—561 4 Claims

1. A process for preparing a hollow fiber which comprises extruding a fusion melt of an acrylonitrile polymer and water through a spinnerette assembly which comprises in combination:

a. a spinnerette plate containing a plurality of orifices with a counterbore for each orifice and,

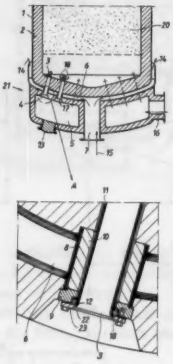
b. removable pins positioned within each orifice counterbore combination, each pin being of solid construction and having an upper portion positioned within said counterbore and a lower portion positioned within said orifice, said upper portion occupying a fixed position within said counterbore and enabling spinning composition to flow through the counterbore to the orifice at operative back pressure and said lower portion being spaced from the orifice wall to provide a hollow extrudate directly into a steam-pressurized solidification zone maintained under conditions of pressure and temperature which prevent sheath-core structure formation in the resulting extrudate.

4,346,054

FLUIDIZABLE BED APPARATUS

Lars Löfgren, and Artur Östlund, both of Linköping, Sweden, assignors to Stal-Laval Apparat AB, Linköping, Sweden

Filed Mar. 13, 1981, Ser. No. 243,449
Claims priority, application Sweden, Mar. 21, 1980, 8002199
Int. Cl.³ B01J *8/44;* F26B *17/10;* F23C *11/02*
U.S. Cl. 422—49 13 Claims



1. A fluidizable bed apparatus comprising:

a container containing a bed of fluidizable particulate material which becomes hot in use, the container having a bottom wall and side walls;

a unitary structure arranged at least partly beneath said bottom wall and including surface means spaced beneath the bottom wall to define therewith at least one passage for the flow therethrough of a cooling medium to cool said bottom wall;

inlet means for supplying a cooling medium to each said passage;

outlet means for withdrawing cooling medium supplied to each said passage;

at least one tubular fixing means secured between said bottom wall and the unitary structure, each said tubular fixing means having a uniform diameter along its length; and

at least one nozzle secured to the unitary structure for introducing a fluidizing medium into said container to create a fluidized bed of said particulate material, each said nozzle passing through a respective tubular fixing means and through a respective through-opening provided by opening means in said bottom wall.

4,346,055

AUTOMATIC IGNITION SYSTEM FOR A FLAME IONIZATION DETECTOR

Andrew J. Murphy, West Grove, Pa.; Robert P. Rhodes, Newark, Del., and Terry A. Woodruff, Kennett Square, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 964,753, Nov. 29, 1978, abandoned.
This application Jun. 13, 1980, Ser. No. 159,034
Int. Cl.³ G01N *21/72, 27/62*
U.S. Cl. 422—54 5 Claims

1. A flame ionization detector, comprising

means for forming a jet from gases to be analyzed and a flammable gas, when said gases are applied thereto,

mixing means for introducing air to the periphery of the jet when air is applied thereto,

a collector tube having one end mounted so as to receive gases from the jet,

an exit tube for exhausting gases from said collector tube,

said exit tube having one end inserted into the other end of said collector tube,

electrical insulating means inserted between said exit tube and said collector tube,

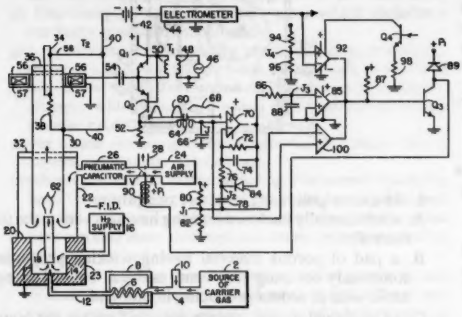
a filament igniter mounted within said collector tube and having its ends respectively connected to said collector tube and said exit tube,

an electrical conductor connected between said exit tube and said collector tube so that it, the exit tube and the filament form a closed electrical loop,

a magnetic core linking said loop,

a winding linking said core,

a transformer having primary and secondary windings, said secondary winding being coupled to said winding for linking said core for causing alternating electrical current to flow through said winding when said primary winding is energized,



a current sensing resistor connected in said circuit with said transformer so that alternating current flows through it when said transformer is energized,

a source of direct current potential and an electrometer connected between said collector tube and said means for forming the jet so as to collect ions produced when the jet is ignited and produce a current proportional to the rate at which ions are collected,

means responsive to the voltage across said resistor for causing said mixing means to reduce the flow of air when said voltage changes by a given amount at a rate exceeding a predetermined value, and

means responsive to the voltage across said resistor for causing said mixing means to restore the flow of air to its former value when said voltage reverts to the value it had when the air was shut off.

4,346,056

AUTOMATIC ANALYZING APPARATUS

Masahiko Sakurada, Machida, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 177,446

Claims priority, application Japan, Aug. 15, 1979, 54/111525[U]; Aug. 17, 1979, 54/112413[U]

Int. Cl.³ G01N *35/04*

U.S. Cl. 422—64 **9 Claims**

1. An automatic analyzing apparatus comprising:

means for containing a plurality of samples to be analyzed in a plurality of containers;

means for delivering each of the samples into respective reaction vessels;

a plurality of reagent vessels containing plural kinds of reagents for effecting a plurality of analysis items;

a reagent vessel holder comprising a turntable for holding said plurality of reagent vessels along a circumference thereof;

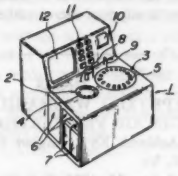
a delivery device for delivering into the reaction vessels a reagent contained in a reagent vessel which is indexed at a delivery position;

means for rotating said reagent vessel holder in such a manner that the reagent vessels arranged in the reagent vessel holder are passed through said delivery position;

first indicia means provided in said reagent vessel holder for denoting an original point of the reagent vessel holder with respect to said delivery position;

second indicia means provided in said reagent vessel holder for discriminating the kind of the reagents;

means for detecting said first and second indicia means formed in said reagent vessel holder to generate an original point signal and a command signal for discriminating the kind of the reagent, respectively;



means for storing a plurality of analysis conditions for all analysis items to be effected by the apparatus, said analysis conditions including an amount of sample to be delivered into the reaction vessel, an amount of reagent to be delivered into the reaction vessel and photometric wavelength;

means for selecting in response to said command signal one of said plurality of the analysis conditions stored in said storing means, the selected analysis condition being related to an analysis item using the relevant reagent denoted by said command signal; and

means for controlling said rotating means under the control of said original point signal and for controlling said delivering means in response to the analysis condition read out from said storing means.

4,346,057

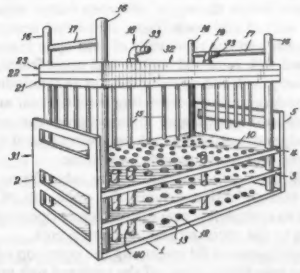
TEST TUBE EVAPORATOR

Everett N. Bowser, 715 N. Main St., Glen Ellyn, Ill. 60137

Filed Jun. 22, 1981, Ser. No. 275,862

Int. Cl.³ B10L *3/00*

U.S. Cl. 422—101 **2 Claims**



1. A test tube evaporator comprising;

a rack having a substantially rectangularly shaped base and upstanding side walls;

supports extending parallel to the base between the side walls below a midline of the said walls;

means provided by the base for receiving the closed end of a test tube;

means provided by the supports, in vertical alignment with the receiving means provided by the base, retaining the

test tubes in a perpendicular position relative to the receiving means;

a chamber removably carried between the upstanding side walls in spaced parallel relation above the supports and the base;

an evaporating needle depending from the underside of and having communication with the chamber concentrically of the means provided by the base for receiving the closed end of a test tube;

means to support the chamber at variations in height above the closed end of a test tube;

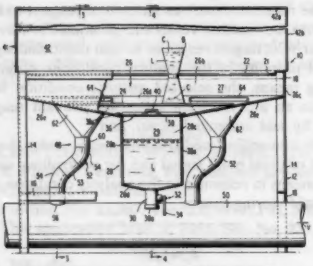
and means to support the chamber in an inverted position, separated from the rack, so that the evaporating needles depending from the chamber are in an upstanding direction, the means to support the chamber at variations in height above the closed end of a test tube being the same as the means to support the chamber in an inverted position.

4,346,058

DUAL LID TYPE COAL WASHABILITY TABLE WITH BUILT-IN AIR VENTILATION SYSTEM

Lee S. Rigsby, Ashland, Ky., assignor to Ashland Coal, Inc., Huntington, W. Va.

Filed Apr. 16, 1981, Ser. No. 254,702
Int. Cl.³ B01L 9/00
U.S. Cl. 422—104 **6 Claims**



1. An improved coal washability table comprising:

opposed, vertical front and rear walls joined at their ends by vertical end walls and defining an elongated rectangular open frame, opening vertically upwardly,

a rectangular sump tank being open at its top and being mounted below the top of said open frame, adjacent to the front wall of said open frame, and being spaced from the end walls and the rear walls of said open frame,

a recessed sink mounted within said open frame, overlying said sump tank and opening thereto and including inclined table sink drain walls extending from the rear and opposite ends of said open frame to respective rear and opposite side edges of said sump tank and being joined to the front, rear and end walls of said open frame,

a first lid pivotably mounted to the table frame along one edge thereof and overlying the open top of said table frame to completely seal off the frame opening providing access to the recessed sink and sump tank,

a removable second lid overlying the open top of said sump tank to selectively close off the recessed sink volume from the sump tank interior,

at least one air register opening provided within the table sink inclined drain walls to the rear of the sump tank,

a horizontal main air ventilation tube underlying said sink and extending longitudinally through said rectangular open frame, and

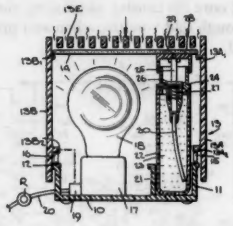
a ventilation tube assembly coupled at one end to said underlying main air ventilation tube and being connected at its opposite end to said at least one air register opening such that when said underlying main air ventilation tube is subjected to low vacuum pressure, toxic and/or noxious vapors created during the performance of separation tests on coal submergable within an organic liquid provided to the sump tank are readily removed from the area of the recessed sink and the sump tank.

4,346,059

AROMA-GENERATING LAMP STRUCTURE

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Mar. 3, 1981, Ser. No. 240,165
Int. Cl.³ A61L 9/04
U.S. Cl. 422—125 **11 Claims**



1. An aroma-generating structure comprising:

A. a substantially enclosed housing having a vent at the top thereof;

B. a pad of porous material having wicking properties completely covering said vent, said pad being impregnated with an aroma-producing liquid; and

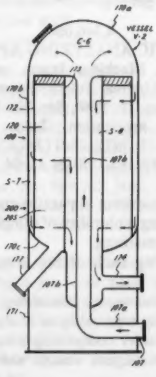
C. an electrical heating means confined within the housing, said means acting to heat and expand the confined air to create a positive air pressure in the housing producing a pressure differential between the heated air and the atmosphere above said vent, thereby driving the heated air through the pad-covered vent to rapidly volatilize the liquid and exude an aromatic vapor into the atmosphere.

4,346,060

RADIAL AMMONIA CONVERTERS

Raymond S. Eagle, and Vishnu A. Patel, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 925,137, Jul. 17, 1978, Pat. No. 4,230,669.
This application Mar. 27, 1980, Ser. No. 134,616
Int. Cl.³ C01C 1/02
U.S. Cl. 422—148 **6 Claims**



1. An ammonia converter, comprising:

a vessel which includes a lower head, a main shell and an upper head;

an internal annular catalyst bed formed by an outer cylindrical wall mounted on said lower head spaced from said main shell to form an annular space between said catalyst bed and said shell and an inner cylindrical retainer wall;

catalyst removal means extending from said lower head;

gas inlet means which includes a vertical pipe section along the axis of said vessel and spaced from said annular catalyst bed and means for directing gas to said annular space between said catalyst bed and said shell; and

outlet means which extend below said lower head concentric with said outlet means for removing the effluent from said catalyst bed.

2. An ammonia converter, comprising:

a vessel which includes a bottom head, a main shell and an upper head;

an internal annular catalyst bed mounted to said main shell, said bed being spaced from and parallel to said main shell;

an interchanger mounted in said vessel which includes a vertically positioned tube bundle;

gas transfer means for passing gas in one direction axially through said vessel and includes the tube side of said tube bundle and a transfer conduit flexibly joined to said interchanger which extends through and is spaced from said annular catalyst bed;

cover means extending from said gas transfer means which covers said annular catalyst bed;

synthesis gas transfer means including inlet means in said top head for introducing synthesis gas at the top of said vessel and diverting said gas by said cover means into the space between said main shell and said outer cylindrical wall of said catalyst bed; and

catalyst bed transfer means including outlet means in said bottom head for removing said catalyst bed effluent and contacting the outside of said tube bundle before passing through said outlet means.

5. An ammonia converter, comprising:

a vessel which includes a bottom head, a main cylindrical shell and a top head;

an internal annular catalyst bed formed by an outer cylindrical wall mounted on an internal head supported by gussets mounted on said bottom head to form an annular space between said catalyst bed and said shell and an inner cylindrical retainer wall;

an interchanger mounted within the annulus of said catalyst bed and spaced from said bed which includes a vertically positioned tube bundle;

gas transfer means which includes inlet means in said top head for passing gas downwardly through the tubes of said tube bundle and between said internal head and said bottom head to said annular space between said catalyst bed and said shell; and

effluent transfer means for passing the major portion of the catalyst bed effluent on the shell side of said tube bundle and then upwardly out of said vessel.

4,346,061

PURIFICATION OF AMMONIUM TUNGSTATE SOLUTIONS

John B. Goddard, Grand Island, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1981, Ser. No. 249,504

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—56 **9 Claims**

1. In the evaporative crystallization of ammonium tungstate solution containing dissolved silicon and phosphorus impurities to obtain ammonium paratungstate, the improvement which comprises adding a soluble aluminum salt or aluminum hydroxide to the ammonium tungstate solution in amounts such that the addition provides about 0.3 to 4 parts by weight of aluminum to 1 part by weight of dissolved silicon expressed as SiO_2 and digesting the resultant solution at a temperature of at least about 45° C. for a period of at least about one half hour immediately prior to crystallization of ammonium paratungstate and then removing precipitated silicon and phosphorus impurities and recovering the crystallized ammonium paratungstate whereby the yield of ammonium paratungstate is increased while at the same time the aluminum content is maintained at a level no greater than about 20 ppm aluminum.

9. Method for recovering tungsten from tungsten ores and concentrates containing molybdenum, silicon and phosphorus impurities, which comprises: digesting the tungsten ore or concentrate with an alkaline solution, treating the digested solution with an acid to precipitate molybdenum and silicon impurities, subjecting the acidified solution to solvent extraction followed by stripping with aqueous ammonium to form an ammonium tungstate solution, adding a soluble aluminum salt or aluminum hydroxide to the ammonium tungstate solution in amounts such that the addition provides about 0.3 to 2 parts by weight of aluminum to 1 part by weight of dissolved silicon as SiO_2, digesting the resultant solution at a temperature of between about 45° C. and 61° C. for a period of between about 0.5 and 3 hours and then recovering crystallized ammonium paratungstate while at the same time removing precipitated silicon and phosphorus, the ammonium paratungstate containing no more than about 20 ppm aluminum.

4,346,062

CHLORINATION LEACHING WITH SULFUR EXTRACTION FOR RECOVERY OF ZINC VALUES

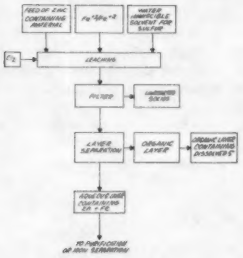
Robert W. Au, Mission Viejo, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 224,996, Jan. 14, 1981, abandoned, which is a division of Ser. No. 32,662, Apr. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 905,127, May 12, 1978, abandoned. This application Feb. 13, 1981, Ser. No. 234,128

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

Int. Cl.³ C25C *1/16*; C22B *19/22*; C01G *9/04*; C01B *17/06*

U.S. Cl. 423—109 **5 Claims**



1. A process for recovering zinc values from zinc sulfide-containing material, comprising the steps of:

(a) partially chlorinating zinc sulfide-containing material in an aqueous medium including recycle solution from step (i) and an aqueous chlorination leaching solution containing elemental chlorine and ferric chloride, in the presence of a water immiscible solvent for sulfur at a temperature below the melting point of sulfur and at about atmospheric pressure, to form an aqueous layer containing zinc chloride, iron, chlorine and partially chlorinated solid residue and a water-immiscible solvent layer containing sulfur;

(b) separating the aqueous layer and water-immiscible solvent layer from the solid residue,

(c) separating the aqueous layer containing zinc chloride, iron and chlorine from the immiscible solvent layer containing sulfur;

(d) treating the separated aqueous layer with elemental chlorine and an alkali to precipitate ferric hydroxide;

(e) separating precipitated ferric hydroxide from the aqueous layer;
(f) recovering zinc values from the aqueous layer;
(g) dissolving the precipitated ferric hydroxide in an acidic medium to form a secondary leaching solution;
(h) leaching additional zinc values from the solid residue with the secondary leaching solution in the presence of chlorine to form a recycle solution containing zinc chloride and iron chloride; and
(i) returning the recycle solution to step (a).

4,346,063

DESULFURIZATION OF HOT GAS WITH CERIUM OXIDE

Robert P. Cahn, Millburn, and John M. Longo, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 16, 1981, Ser. No. 243,720
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—230 19 Claims

1. A process for removing H_2S from a gas stream comprising H_2S and oxygen wherein said oxygen is present in said gas in an amount at least equal to that stoichiometrically required to convert the H_2S to cerium oxysulfate, said process comprising contacting said gas stream with cerium oxide at a temperature of at least about 350° C. to produce a gas of reduced H_2S content.

4,346,064

DECONTAMINATION OF COMBUSTION GASES IN FLUIDIZED BED INCINERATORS

Albert M. Leon, Mamaroneck, N.Y., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Dec. 12, 1980, Ser. No. 215,579
Int. Cl.³ B01J *8/00;* C01B *17/00*
U.S. Cl. 423—244 7 Claims

1. A process for effectively removing sulfur and sulfur oxide atmospheric pollutants from a gaseous stream produced by the incineration of one or more combustible feed materials containing either molecular or combined sulfur or both comprising, passing said stream upwardly through a high temperature contact zone defined by a fluidized bed of countercurrent, descending sorbent particulate material capable of combining at the high temperature with said pollutants to provide a solid adduct, the opposed points of entry of said sorbent particulate and combustible feed materials respectively being such that said sorbent and combustion products of said combustible feed materials traverse at least about 90% of the vertical extent of said contact zone and wherein concentration gradients are maintained vertically.

4,346,065

PROCESS FOR THE MANUFACTURE OF FINELY DISPERSED SPARINGLY SOLUBLE SALTS OF OXYACIDS OF PHOSPHORUS

Alexander Maurer; Renate Adrian, both of Hürth, and Gero Heymer, Erftstadt-Liblar, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 2, 1981, Ser. No. 222,079
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951126
Int. Cl.³ C01B *15/16, 25/26;* C04B *11/22*
U.S. Cl. 423—305 7 Claims

1. In a process for the manufacture of a finely dispersed, sparingly soluble divalent metal salt of an oxyacid of phosphorus, having a maximum particle size of 20 μm, by reacting a compound of a divalent metal with the oxyacid of phosphorus or an alkali metal or ammonium salt thereof, the improvement which comprises reacting an at least 5% by weight aqueous solution or suspension of a compound of a divalent metal selected from the group consisting of Mg, Ca, Sr, Ba, Mn, Zn, Cu, Cd, Pb, Sn, Co and Ni, while maintaining a pH range of between 3 and 9 and while stirring, with an at least 2 mol% solution of at least one trivalent metal selected from the group consisting of Al, Fe
and Cr in the oxyacid of phosphorus or with an at least 2 mol% solution of at least one trivalent metal selected from the group consisting of Al, Fe and Cr in the oxyacid of phosphorus and an aqueous solution of an alkali metal or ammonium salt of the oxyacid of phosphorus, the compound of the divalent metal and that of the trivalent metal being used in the reaction mixture in a molar ratio of from 9:1 to 50:1, with the resultant formation of the finely dispersed divalent metal salt of the oxyacid of phosphorus, at least 90% of the particles of which salt have a size between 0.05 and 7 μm, and separating and drying the precipitated salt.

4,346,066

PURIFICATION OF WET-PROCESS PHOSPHORIC ACID

Reinhard Gradl, Hürth; Klaus Schrödter, Cologne; Klaus-Peter Ehlers, Erftstadt, and Wolfgang Scheibitz, Frankfurt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,365
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926943
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—321 S 9 Claims

1. In the process for purifying an aqueous solution of phosphoric acid which comprises the steps of extracting countercurrently with respect to each other an organic solvent and an aqueous phosphoric acid solution with the resulting formation of an organic and an aqueous phase, in a plurality of extraction zones each consisting of a mixing zone and a separating zone, said organic solvent being immiscible or partially miscible with water, separating an organic phosphoric acid extract obtained from a remaining aqueous raffinate, and recovering purified phosphoric acid from the organic phosphoric acid extract, the improvement which comprises using the aqueous phase as the continuous phase and dispersing therein the organic phase by filling the mixing zones with the aqueous phase prior to starting the extraction, feeding continuously to said extraction zones the organic solvent and the phosphoric acid solution in a volume ratio of at least 2:5 to 1, and providing and maintaining within the mixing zones of said extraction zones the organic and the aqueous phase at a volume ratio of at most 1 to 1.

4,346,067

METHOD OF ION EXCHANGE ZEOLITES

William A. Wachter, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1981, Ser. No. 278,163
Int. Cl.³ C01B *33/20, 33/28*
U.S. Cl. 423—326 11 Claims

1. A method of cation exchanging an alkali metal cation-containing crystalline metallosilicate zeolite which comprises the steps of:
(a) contacting said zeolite with an ion exchange medium comprising an ammonium ion, urea, and water;
(b) heating the resulting mixture to a temperature and for a time sufficient to evaporate said water and to solidify the remaining mixture, and
(c) recovering an ammonium exchanged crystalline metallosilicate zeolite having a decreased content of alkali metal cation.

4,346,068

PROCESS FOR PREPARING HIGH-PURITY α-TYPE SILICON NITRIDE

Kiyoshi Kasai; Yoshitaka Kubota, and Takaaki Tsukidate, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin Nanyo, Japan

Filed Jan. 5, 1981, Ser. No. 222,671
Claims priority, application Japan, Jan. 11, 1980, 55-1404
Int. Cl.³ C01B *21/068*
U.S. Cl. 423—344 2 Claims

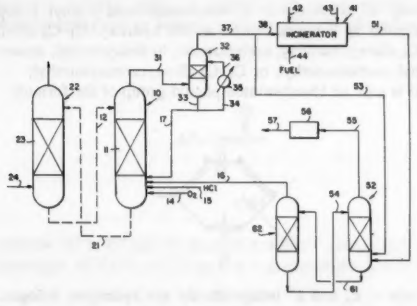
1. A process for preparing silicon nitride which comprises heating a nitrogen-containing silane compound at a temperature in the range of about 1,300° C. to about 1,600° C. in an ammonia gas atmosphere in a heating furnace made of a metal selected from the group consisting of molybdenum, zirconium, tantalum and alloys thereof to obtain a high-purity α-type silicon nitride, said nitrogen-containing silane compound obtained by reacting silicon tetrachloride with ammonia in the gaseous phase in an inert atmosphere at a temperature of from −30° C. to 70° C.

4,346,069

RECOVERY OF CHLORINE VALUES IN INTEGRATED PROCESS FOR OXYCHLORINATION AND COMBUSTION OF CHLORINATED HYDROCARBONS

Herbert Riegel, Maplewood, and Chiung-Yuan Huang, Glen Ridge, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jan. 26, 1981, Ser. No. 228,462
Int. Cl.³ C01B *7/01*; C07C *21/00*
U.S. Cl. 423—488 3 Claims



1. A process for integrating an oxychlorination reaction with combustion of chlorinated hydrocarbons, comprising:

recovering a gas containing hydrogen chloride and water vapor from an oxychlorination reaction;

combusting a chlorinated organic compound to produce a combustion gas including chlorine values from the chlorinated organic compound essentially as hydrogen chloride;

simultaneously treating effluent from the combusting and said gas from the oxychlorination reaction to recover anhydrous hydrogen chloride therefrom; and

employing recovered anhydrous hydrogen chloride in the oxychlorination reaction.

4,346,070

TEST FOR TERATOGENIC POTENTIAL EMPLOYING HYDRA

E. Marshall Johnson, Philadelphia, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Apr. 11, 1980, Ser. No. 139,269
Int. Cl.³ A61K *49/00*; C12Q *1/00*
U.S. Cl. 424—9 7 Claims

1. A method of determining the mammalian teratogenic potential of a compound (agent) of unknown mammalian teratogenic effect, comprising the steps of:

(a) providing a plurality of artificial embryos of Hydra, said artificial embryos comprising Hydra cell pellets;

(b) chronically exposing said embryos to varying preselected concentrations of said compounds;

(c) observing said chronically exposed embryos over time to estimate a minimum teratogenic concentration of said compound required to interfere with the development of said embryo after a length of time;

(d) comparing said minimum teratogenic concentration to a minimum adult reference concentration of said compound which is toxic to normal adult Hydra;

whereby the mammalian teratogenic potential of said compound is indicated by the degree of difference between said teratogenic and adult reference concentrations.

4,346,071

REHYDRATED SILICA GEL DENTIFRICE ABRASIVE

Anthony L. Dent, Bala Cynwyd; M. Robert Derolf, Pottstown, both of Pa., and Elliot P. Hertzenberg, Wilmington, Del., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 90,167, Nov. 1, 1979, abandoned. This application Sep. 11, 1980, Ser. No. 186,083
Int. Cl.³ A61K *7/16*
U.S. Cl. 424—49 4 Claims

1. In the known multi-component dentifrice characterized in that silica gel is the abrasive cleansing agent the improvement consisting of a rehydrated silica gel abrasive cleansing agent which has a radioactive dentin abrasion (RDA) value of at least 30 units/g of anhydrous SiO_2 in a test wherein calcium pyrophosphate has an RDA value of 10 units per gram, said rehydrated silica constituting 5 to 80% of the weight of the dentifrice, having an average particle size of 5 to 18 μm, containing 25 to 45% by weight of water and being prepared by drying a silica hydrogel to a water content of 5 to 15% by weight and rehydrating said gel to 25 to 45% by weight of water.

4,346,072

DENTIFRICES

Eric Baines, Flixton, and John F. Carr, Knutsford, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 50,935, Jun. 21, 1979, abandoned, which is a continuation of Ser. No. 871,677, Jan. 23, 1978, abandoned, which is a continuation of Ser. No. 766,658, Feb. 8, 1977, abandoned, which is a continuation of Ser. No. 640,663, Dec. 15, 1975, abandoned. This application Sep. 12, 1980, Ser. No. 186,804
Claims priority, application United Kingdom, Dec. 13, 1974, 53932/74; May 29, 1975, 23454/75; May 29, 1975, 23455/75
The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.
Int. Cl.³ A61K *7/16*
U.S. Cl. 424—49 5 Claims

1. An aqueous toothpaste comprising milled alpha-alumina trihydrate abrasive particles produced by milling Bayer process alkaline alpha-alumina trihydrate in the presence of a surface-modifying agent, wherein said surface-modifying agent is a carboxylic acid which contains a polar and a non-polar group.

4,346,073

HEPATITIS B IMMUNE GLOBULIN USED TO INACTIVATE HEPATITIS B VIRUS IN INJECTABLE BIOLOGICAL PRODUCTS

David L. Aronson; Edward Tabor, and Robert J. Gerety, all of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 11, 1980, Ser. No. 139,236
Int. Cl.³ A61K *39/42*
U.S. Cl. 424—86 5 Claims

1. A method of preventing the transmission of hepatitis B by injectable biological products made from pooled plasma comprising treatment of the biological products with an effective amount of hepatitis B immune globulin in vitro prior to administration to laboratory animals and humans.

4,346,074

PASTEURELLOSIS VACCINES

Neil J. L. Gilmour, Falkirk; William B. Martin, Longniddry; James M. Sharp, Haddington, all of Scotland; Dennis A. Thompson, Hayes, England, and Peter W. Wells, Haddington, Scotland, assignors to National Research Development Corp., London, England

PCT No. PCT/GB79/00141, § 371 Date Apr. 23, 1980, § 102(e) Date Apr. 23, 1980, PCT Pub. No. WO80/00412, PCT Pub. Date Mar. 20, 1980
PCT Filed Aug. 16, 1979, Ser. No. 194,122
Claims priority, application United Kingdom, Aug. 24, 1978, 34525/78
Int. Cl.³ A61K *39/00, 39/102*
U.S. Cl. 424—92 22 Claims

1. A pasteurellosis vaccine comprising antigenic material derived from the A1 and A2 serotypes of *Pasteurella haemolytica,* wherein the A1 serotype antigenic material comprises capsular extract and the A2 serotype antigenic material comprises heat-killed whole organisms.

13. A process for the production of a pasteurellosis vaccine comprising: cultivating organisms of the A1 and A2 serotype of *P. haemolytica;* preparing antigenic material of the A2 serotype by heat-killing whole organisms of the A2 serotype; preparing antigenic material of the A1 serotype by forming a capsular extract from organisms of the A1 serotype; and admixing said antigenic materials of the A1 and A2 serotypes.

4,346,075

ANTIBIOTIC DC-11 AND PROCESS FOR PRODUCTION THEREOF

Fusao Tomita; Tatsuya Tamaoki; Nobuo Nakamura, all of Machida; Shuji Okubo, Matsudo; Kunikatsu Shirahata, Machida; Masaji Kasai, Fujisawa, and Tetsuo Oka, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 31,912, Apr. 20, 1979, abandoned. This application Apr. 8, 1981, Ser. No. 252,062
Claims priority, application Japan, Jun. 14, 1980, 55-80482; Aug. 20, 1980, 55-114373; Sep. 18, 1980, 55-128605
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—120 4 Claims

1. A composition of matter, DC-11, characterized by:
Melting point: 225°–228° C. (decomposition)
Elementary analysis: H=6.9%, C=59.0%, N=2.0%
Infrared absorption spectrum measured in KBr tablet substantially as shown in FIG. 1;
Ultraviolet absorption spectrum in methanol substantially as shown in FIG. 2;
Proton magnetic resonance spectrum in $CDCl_3$ substantially as shown in FIG. 3;
Carbon magnetic resonance spectrum in $CDCl_3$ substantially as shown in FIG. 4; and
Specific optical rotation: $[\alpha]_D^{20} = -86.3$ (C=1.0, acetone).

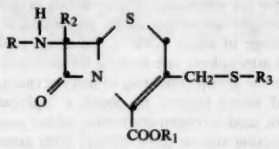
4,346,076

BIS-TETRAZOYLMETHYL SUBSTITUTED CEPHALOSPORIN ANTIBIOTICS

Allen S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

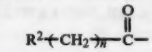
Filed Sep. 17, 1980, Ser. No. 187,859
Int. Cl.³ A61K *31/545;* C07D *501/56*
U.S. Cl. 424—246 32 Claims

1. A compound of the formula



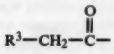
wherein R is an acyl group of the formula

wherein R^1 is C_1–C_4 alkyl or C_1–C_4 alkyl substituted by halogen or cyano; or R is an aroyl or aralkanoyl group of the formula

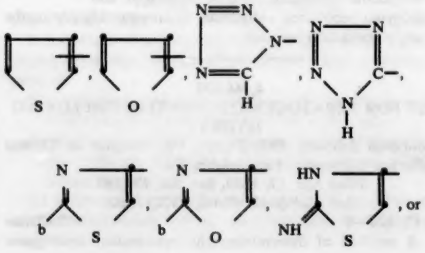


wherein R^2 is phenyl or a mono-substituted phenyl group substituted by halogen, cyano, amino, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, carboxy, carboxamido, hydroxymethyl, aminomethyl, carboxymethyl, or C_1–C_4 alkoxycarbonylmethyl;
or R^2 is a di- or tri-substituted phenyl group of the formula

wherein a, a′, and a″ independently are hydrogen, halogen, hydroxy, C_1–C_4 alkoxy, provided that only one of a, a′ and a″ may be hydrogen, and n is 0 or 1;
or R is a heteroarylalkanoyl group of the formula



wherein R^3 is a group of the formula



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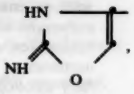
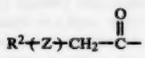


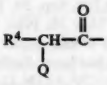
wherein each b is hydrogen, amino, protected-amino, C_1–C_3 alkyl or phenyl;

or R is an aryloxyacetyl or arylthioacetyl group of the formula

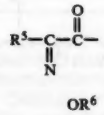


wherein R^2 has the same meanings as defined above and Z is O or S;

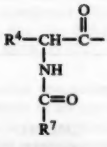
or R is a substituted aralkanoyl or heteroarylalkanoyl group of the formula



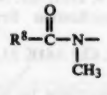
wherein R^4 is R^2 as defined above, and in addition is 1,4-cyclohexadienyl, thienyl or furyl, and Q is hydroxy, formyloxy, carboxy, sulfo, or amino; or R is an oximino-substituted aralkanoyl or heteroarylalkanoyl group of the formula



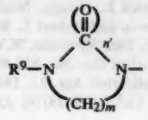
wherein R^5 is R^2 and R^3 as each is defined above, and R^6 is hydrogen, or C_1–C_4 alkyl, or R is a group of the formula



wherein R^4 has the same meanings defined above and R^7 is phenyl substituted by from 1 to 3 hydroxy groups, or pyridyl substituted by from 1 to 3 hydroxy groups, or a group of the formula



wherein R^8 is C_1–C_4 alkylamino, phenyl, halophenyl, furyl, styryl, nitrostyryl or halostyryl; or R^7 is a group of the formula

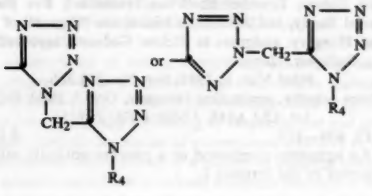


wherein n' is 1 or 2 and m is 2 or 3, with the limitation that when n' is 2, m is 2, and R^9 is hydrogen, C_1–C_3 alkyl, C_2–C_4 alkanoyl, or C_1–C_3 alkylsulfonyl;

R_1 is hydrogen or a carboxy protecting group;

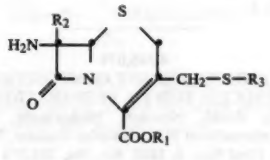
R_2 is hydrogen or methoxy;

R_3 is a bis-tetrazolylmethyl group of the formula

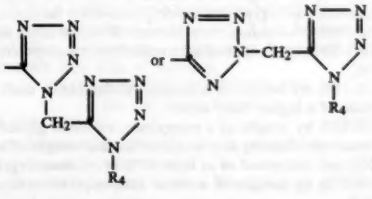


wherein R_4 is hydrogen, or C_1–C_3 alkyl; and when R_1 is hydrogen the pharmaceutically acceptable, non-toxic salts thereof.

22. The compound of the formula



wherein R_1 is hydrogen or a carboxy-protecting group; R_2 is hydrogen or methoxy; and R_3 is a bis-tetrazolylmethyl group of the formula



wherein R_4 is hydrogen or C_1–C_3 alkyl.

26. An antibiotic pharmaceutical formulation comprising an effective amount of an antibiotic compound of claim 1, wherein R_1 is hydrogen or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,346,077

METHOD FOR REDUCING INCIDENCE OF PERIPARTURIENT DISORDERS IN COWS

Darwin G. Braund, Fayetteville; Thomas J. Fronk, Newfield, both of N.Y.; Richard L. Goings, Nashua; John W. Peters, Manson, both of Iowa, and Robert L. Steele, Syracuse, N.Y., assignors to Agway, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 132,483, Mar. 21, 1980, abandoned. This application Apr. 13, 1981, Ser. No. 253,374

Int. Cl.³ A61K *33/06, 33/10*

U.S. Cl. 424—156 8 Claims

1. A nutritional method for reducing the occurrence of milk fever and retained placenta in periparturient cows consisting essentially of administering to each cow a single, forced, oral dosage of nutritional supplement including between about 18 and 36 grams of readily absorbable calcium within a period of 0 to 8 hours after parturition.

4,346,078

NOVEL ANTICOAGULANT AGMATINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Sandor Bajusz; Erzsebet Szell nee Hasenöhrl; Eva Barabas; Daniel Bagdy, and Zsuzsanna Mohai nee Nagy, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Mar. 6, 1981, Ser. No. 241,356

Claims priority, application Hungary, Oct. 7, 1980, GO 1449

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 8 Claims

1. An agmatine compound or a pharmaceutically effective salt thereof of the formula I:

X—Pro—Agm-(HB)$_n$

wherein

X is an α-amino acid moiety of D-configuration, having a phenyl, phenyl-lower-alkyl, or phenyl-lower alkyl wherein the lower alkyl is interrupted by an oxygen atom,

Pro is an L-proline residue,

Agm is an agmatine group,

B is chloride and

n is 0, 1 or 2.

4,346,079

SOLID ANTIPERSPIRANT COMPOSITION AND PROCESS FOR ITS PREPARATION

Ernst-Ludwig Roehl, Naarden, Netherlands, assignor to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Nov. 3, 1980, Ser. No. 203,374

Claims priority, application Netherlands, Nov. 7, 1979, 7908149

Int. Cl.³ A61K *7/34, 7/36, 7/38*

U.S. Cl. 424—65 10 Claims

1. In a solid transparent gelled antiperspirant composition comprising

(a) 5–80% by weight of a lower monohydric alcohol,

(b) 5–75% by weight of a dihydric alcohol, a polyhydric alcohol, a polyglycol or a polyglycol ether having at least one hydroxyl radical, or a mixture of two or more thereof,

(c) 0.5–10% by weight of dibenzaldehydemonosorbitol acetal,

(d) 0–15% by weight of a monoalkylolamide or dialkylolamide of a higher fatty acid,

(e) 0–10% by weight of a propylene-/ethylene glycol polycondensate having an average molecular weight of at least 500 and composed of at least 60% propyleneoxygroups,

(f) 2–20% by weight of a metal antiperspirant compound, and

(g) 0–1% by weight of a higher fatty acid, wherein the improvement comprising incorporating 0.1 to 25% by weight of an oleaginous compound to lessen stickiness of said composition, said oleaginous compound selected from the group consisting of an ester of a monohydric alcohol with a monobasic carboxylic acid, an ester of a monohydric alcohol with a polybasic carboxylic acid, an ester of a polyhydric alcohol with a monobasic carboxylic acid, an ester of a polyhydric alcohol with a polybasic carboxylic acid, a siloxane having a viscosity of 0.01 to 25 centistokes, a hydrocarbon having a boiling point of a maximum of 350° C. at one atmosphere pressure, saturated fatty alcohols being liquid at room temperature, unsaturated fatty alcohols being liquid at room temperature, and a mixture of two or more compounds of said group.

4,346,080

CYCLOHEXYL PHENETHYLETHER USED FOR COMBATTING TOBACCO BEETLES

Jacob Kiwala, Brooklyn, N.Y.; Richard J. Tokarzewski, Keyport, N.J.; Frederick L. Schmitt, Holmdel, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

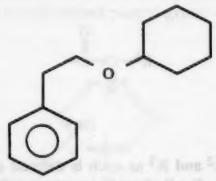
Division of Ser. No. 192,238, Sep. 30, 1980, Pat. No. 4,306,096. This application May 28, 1981, Ser. No. 267,905

The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.³ A01N *25/00*

U.S. Cl. 424—84 2 Claims

1. A method of attracting and destroying *Lasioderma Sericorne* (F.) comprising applying to an area contaminated with said *Lasioderma Serricorne* (F.) said cyclohexyl phenethylether having the structure:



said attractant being applied to said area in an amount sufficient to attract said *Lasioderma Serricorne* (F.).

4,346,081

COMPOSITIONS FOR INGESTION BY RUMINANTS TO REMOVE PROTOZOA, PROCESS FOR THEIR PREPARATION AND USE OF THESE COMPOSITIONS FOR THE FEEDING OF RUMINANTS

Ignace Gago, Braine-l'Alleud, and Guillaume Coppens, Brussels, both of Belgium, assignors to Interox (Societe Anonyme), Brussels, Belgium

Filed Jan. 9, 1981, Ser. No. 223,775

Claims priority, application France, Jan 11, 1980, 80 00774

Int. Cl.³ A61K *33/40*

U.S. Cl. 424—130 10 Claims

1. Composition for ingestion by ruminants and having a protozoa removing effect comprising an effective protozoa removing amount of a peroxide of a metal of group 2 of the Periodic Table in a ruminant feed.

4,346,082

METHOD OF EMPLOYING THERAPEUTIC COMPOSITION COMPRISING AMMONIUM OR SUBSTITUTED AMMONIUM COMPOUNDS FOR TREATMENT OF ALCOHOLISM

Emanuel Revici, New York, N.Y., assignor to The Vinoxen Company, New York, N.Y.

Continuation of Ser. No. 109,699, Jan. 4, 1980, abandoned, which is a continuation of Ser. No. 2,591, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 839,567, Oct. 5, 1977, abandoned. This application Feb. 27, 1981, Ser. No. 239,091

Int. Cl.³ A61K *33/04, 33/02, 31/19*

U.S. Cl. 424—162 **14 Claims**

1. A method for treating alcoholism or for eliminating, reducing or preventing alcohol intoxication or the manifestation of alcohol intoxication in a host, which comprises administering thereto a therapeutic composition comprising a non-toxic compound containing a cation selected from the group consisting of ammonium and substituted ammonium, and wherein the anion portion of the compound contains sulfur, said compound having a pH greater than about 5.0 when in aqueous solution at a concentration of 5 grams per 100 grams of solution, in an amount sufficient to eliminate, reduce or prevent alcohol intoxication or the manifestations of alcohol intoxication.

4,346,083

BIOLOGICALLY ACTIVE AMIDES

Samuel Wilkinson, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 927,271, Jul. 24, 1978, Pat. No. 4,244,944. This application Sep. 25, 1980, Ser. No. 191,150

Claims priority, application United Kingdom, Nov. 24, 1977, 48980/77

Int. Cl.³ A61K *37/00*; **C07C** *103/52*

U.S. Cl. 424—177 **7 Claims**

1. Tyr.D-Met. Gly. Phe($4NO_2$). $ProNH_2$.

4,346,084

PROCESS AND COMPOSITION FOR TREATING DISORDERS BY ADMINISTERING LITHIUM AND CHOLINE

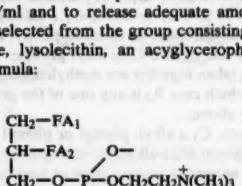
John H. Growdon, Brookline, and Richard J. Wurtman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 126,124, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 88,227, Oct. 25, 1979, abandoned, which is a continuation of Ser. No. 847,967, Nov. 2, 1977, abandoned. This application Jan. 30, 1981, Ser. No. 229,802

Int. Cl.³ A61K *31/265, 31/685*

U.S. Cl. 424—199 **10 Claims**

1. A composition of matter comprising (a) a physiologically acceptable source of lithium in an amount to treat manic-depressive illness which, when administered to a human causes side effects associated with inadequate release of brain acetylcholine and (b) an amount of a compound effective to raise the bloodstream choline level of a patient to between about 10 and 50 nanomoles/ml and to release adequate amounts of brain acetylcholine selected from the group consisting of choline, a salt of choline, lysolecithin, an acyglycerophosphocholine, having the formula:



wherein FA_1 and FA_2 can be the same or different and are fatty acid residues having from 6–26 carbon atoms, glycerophosphatidyl choline and mixtures thereof.

4,346,085

PROCESS AND COMPOSITION FOR TREATING DISORDERS BY ADMINISTERING AMPHETAMINE AND CHOLINE

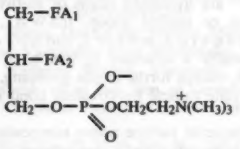
John H. Growdon, Brookline, and Richard J. Wurtman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 126,124, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 88,227, Nov. 25, 1979, abandoned, which is a continuation of Ser. No. 847,967, Nov. 2, 1977, abandoned. This application Jan. 30, 1981, Ser. No. 229,812

Int. Cl.³ A61K *31/131, 31/445, 31/685*

U.S. Cl. 424—199 **12 Claims**

1. A composition of matter comprising (a) a drug which, when administered to a human causes side effects associated with inadequate release of brain acetylcholine, said drug being selected from the group consisting of amphetamine and methylphenidate and (b) an amount of a compound effective to raise the bloodstream choline level of a patient to between about 10 and 50 nanomoles/ml and to release adequate amounts of brain acetylcholine selected from the group consisting of choline, a salt of choline, lysolecithin, an acyglycerophosphocholine having the formula:



wherein FA_1 and FA_2 can be the same or different and are fatty acid residues having from 6–26 carbon atoms, glycerophosphatidyl choline and mixtures thereof.

4,346,086

CORTICOSTEROID-CONTAINING CREAM

Henning Sattler, Hamburg, and Georg A. Ulex, Moorrege, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,884

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—243 **22 Claims**

1. A corticosteroid-containing cream comprising

(a) 0.05–0.5 parts fluocortolone

(b) 2.5–20 parts fatty acid sorbitan esters and/or mixtures of fatty acid mono- and diglycerides

(c) 1–5 parts fatty acid monoglycerides

(d) 1–10 parts beeswax

(e) 5–25 parts liquid paraffin

(f) 25–75 parts petroleum jelly and water ad 100 parts,

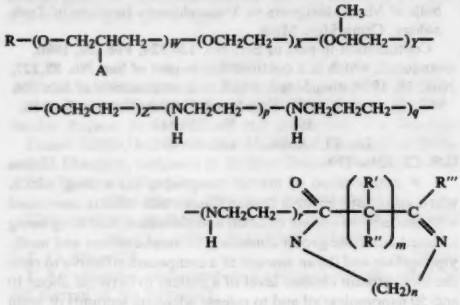
all parts being by weight.

4,346,087
ANTIBACTERIAL SURFACE ACTIVE AGENT CONTAINING AZAALKENELACTAM

Hiroyoshi Hamanaka, Yachio, and Mamoru Shinano, Negishi, both of Japan, assignors to Toho Chemical Industry Co., Ltd., Japan

PCT No. PCT/JP80/00055, § 371 Date Dec. 1, 1980, § 102(e) Date Dec. 1, 1980, PCT Pub. No. WO80/02155, PCT Pub. Date Oct. 16, 1980
PCT Filed Mar. 28, 1980, Ser. No. 224,520
Claims priority, application Japan, Mar. 30, 1979, 54/38254
Int. Cl.³ A61K *31/55*; C07D *243/08*
U.S. Cl. 424—244 **21 Claims**

1. A cyclic amide compound of the formula



wherein R is an alkyl group, alkenyl group, monoalkylphenyl group, monoalkylbenzyl group, hydroxyalkyl group, alkylcarbonyl group, alkenylcarbonyl or hydroxysubstituted alkyl- or alkenyl-carbonyl group having 8 to 22 carbon atoms in total, R′, R″ and R‴ are hydrogen atoms or methyl groups, A is hydrogen atom or methyl group, $0 \leqq W \leqq 1$, $0 \leqq X+Z \leqq 3$, $0 \leqq Y \leqq 3$, $0 \leqq p+q+r \leqq 3$, m=1 or 2, and n=2 or 3; said compound may assume a structure in which, if necessary, the nitrogen atoms, except forthe amide grouping, may combine with a carboxylate radical by covalent bond or to add to a carboxylate.

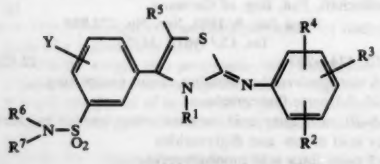
21. An antibacterial surface active composition comprising water and an antibacterially effective amount of a cyclic amide compound in accordance with claim **1**.

4,346,088
THIAZOLINE DERIVATIVES

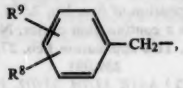
Hans-Jochen Lang, Hofheim am Taunus; Bernhard Seuring, Frankfurt am Main, and Ernold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,218
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926771
Int. Cl.³ A61K *31/425*; C07D *277/38, 417/12*
U.S. Cl. 424—248.51 **13 Claims**

1. Thiazoline derivative of the formula



in which R^1 denotes alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or alkenyl of 3 to 4 carbon atoms; R^2, R^3 and R^4 are identical or different and denote hydrogen, halogen, alkyl or alkoxy of 1 to 4 carbon atoms, dimethyl- or diethylamino or trifluoromethyl, or any two of R^2, R^3 and R^4 together denote methylenedioxy or ethylenedioxy; R^5 denotes hydrogen or alkyl of 1 to 3 carbon atoms; R^6 denotes hydrogen or alkyl of 1 to 6 carbon atoms; R^7 denotes hydrogen, alkyl of 1 to 12 carbon atoms, cycloalkyl of 3 to 12 carbon atoms, allyl, phenethyl or a benzyl of the formula



in which R^8 and R^9 are identical or different and denote hydrogen, methyl, chlorine or methoxy, or R^6 and R^7 together represent an alkylene chain which can be branched and has a total of up to 8 carbon atoms and in which one methylene group can be replaced by —O— or

and Y denotes hydrogen, halogen or alkyl of 1 to 3 carbon atoms; an alkali or alkaline earth mtal salt thereof, or an acid addition salt thereof with a pharmacologically acceptable acid.

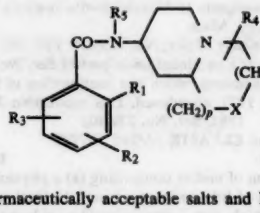
13. Process for the treatment of a lipid metabolism disorder which comprises administering to a patient suffering therefrom a hypolipidaemically effective amount of a compound as defined in claim **1**.

4,346,089
1-AZA-4-OXA-BICYCLO [4,4,0]DECANE DERIVATIVES

Michael S. Hadley, Sawbridgeworth; Francis D. King, Newport, and Roger T. Martin, Harlow, all of England, assignors to Beecham Group Limited, England

Filed Jan. 28, 1981, Ser. No. 229,191
Claims priority, application United Kingdom, Jan. 30, 1980, 8003154; Sep. 6, 1980, 8028864
Int. Cl.³ A61K *31/535*; C07D *265/36*
U.S. Cl. 424—248.52 **9 Claims**

1. A compound of the formula (I):



(I)

and pharmaceutically acceptable salts and N-oxides thereof, wherein:

R_1 is a C_{1-6} alkoxy group;

R_2 and R_3 are the same or different and are hydrogen, halogen, CF_3, C_{1-7}acyl, C_{1-7} acylamino, C_{1-6} alkyl-$S(O)_n$ wherein n is 0, 1 or 2, nitro, C_{1-6} alkoxy, hydroxy, or amino, aminocarbonyl or aminosulphonyl optionally substituted by one or two C_{1-6} alkyl groups;

or R_1 and R_2 taken together are methylenedioxy or ethylenedioxy in which case R_3 is any one of the groups given for R_1 and R_2 above;

R_4 is hydrogen, C_{1-4} alkyl, phenyl or phenyl C_{1-4} alkyl;

R_5 is hydrogen or C_{1-4} alkyl;

X is oxygen atom;

p is 1; and

r is 1.

8. A pharmaceutical composition comprising a compound according to claim **1** in an amount effective for the treatment of

disorders related to impaired gastro-intestinal motility, together with a pharmaceutically acceptable carrier.

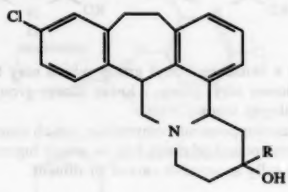
4,346,090

13-CHLORO-BENZOCYCLOHEPTAPYRIDOISOQUINOLINES AND USE AS NEUROLEPTICS

Leslie G. Humber, Dollard des Ormeaux; Francois T. Bruderlein, Guertin Montreal, and Andre A. Asselin, St. Laurent, all of Canada, assignors to Ayerst, McKenna & Harrison Ltd., Montreal, Canada

Filed Jul. 21, 1977, Ser. No. 817,660
Int. Cl.³ A61K *31/435;* C07D *221/18*
U.S. Cl. 424—258 8 Claims

1. A compound of formula 1



(I)

in which R is lower alkyl selected from the group consisting of straight chain alkyl having up to six carbon atoms and branched chain alkyl having up to four carbon atoms or R is cycloalkyl having 3–6 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

7. A method of producing neuroleptic effects in a mammal which comprises administering to said mammal an effective neuroleptic amount of a compound of claim 1, or a pharmaceutically acceptable salt thereof.

4,346,091

INSECTICIDAL COMBINATIONS

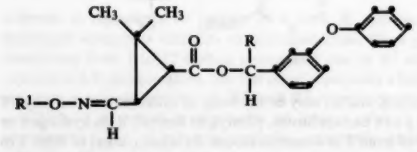
James R. Sanborn, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 153,285, May 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 93,348, Nov. 13, 1979, abandoned. This application Oct. 16, 1981, Ser. No. 311,846
Int. Cl.³ A01N *37/08, 37/34, 43/42*
U.S. Cl. 424—258 2 Claims

1. An insecticidal composition containing as active ingredient a combination of

(a) 3,4-dihydro-2-(2-propynyl)isocarbostyril, and

(b) a pyrethroid of the formula



(I)

wherein R is hydrogen or cyano (—CN), and R^1 is cycloalkylmethyl of from four to eight carbon atoms, or branched-chain alkyl of from three to ten carbon atoms, with the proviso that pyrethroid is in the (1R,cis) isomeric configuration, in the proportion of from about 0.002 to about 0.05 part by weight of (a) per part by weight of (b).

4,346,092

INSECTICIDAL COMBINATIONS

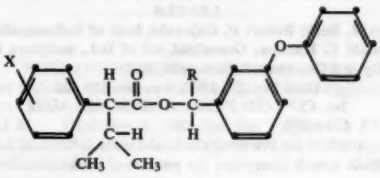
James R. Sanborn, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 153,285, May 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 93,348, Nov. 13, 1979, abandoned. This application Oct. 16, 1981, Ser. No. 311,849
Int. Cl.³ A01N *37/10, 37/34, 43/42*
U.S. Cl. 424—258 2 Claims

1. An insecticidal composition containing as active ingredient a combination of

(a) 3,4-dihydro-2-(2-pyropynyl)isocarbostyril, and

(b) a pyrethroid of the formula



wherein R is hydrogen or cyano (—CN), and X is chlorine, bromine, fluorine, difluoromethoxy, or alkoxy of from one to four carbon atoms, in the proportion of from about 0.002 to about 0.05 part by weight of (a) per part by weight of (b).

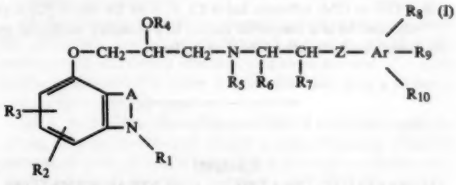
4,346,093

HETEROCYCLIC OXYPROPANOLAMINE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Walter-Gunar Friebe, Darmstadt; Helmut Michel, Mannheim; Carl H. Ross, Viernheim; Fritz Wiedemann, Weinheim-Lützelsachsen; Wolfgang Bartsch, Viernheim, and Karl Dietmann, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jan. 31, 1980, Ser. No. 117,190
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905877
Int. Cl.³ A61K *31/41;* C07D *249/18*
U.S. Cl. 424—269 18 Claims

1. Heterocylic oxypropanol compounds of the formula



(I)

wherein

R_1, R_2, R_6 and R_7 are individually selected from hydrogen or lower alkyl with 1 to 6 carbon atoms;

R_3, R_4, R_5 and R_{10} are each hydrogen

Z is a valency bond or oxygen;

Ar is phenyl;

R_8, R_9 are identical or different, hydrogen, alkyl with up to 6 carbon atoms, alkenyl with up to 6 carbon atoms, allyloxy, alkylthio with up to 6 carbon atoms, alkanoylamino in which the alkanoyl component contains up to 8 carbon atoms, alkanoylamino in which the alkanoyl component contains up to 8 carbon atoms, alkanoyl

with up to 8 carbon atoms, aminocarbonyl or benzyloxy; and

A is -N=N-.

13. Method of treating a subject for circulatory and cardiac diseases which comprises administering to an afflicted subject, a pharmacologically effective amount of a heterocyclic oxypropanol compound as claimed in claim 1.

4,346,094

3-ARYL-5-ISOTHIAZOLECARBOXYLIC ACIDS AND RELATED COMPOUNDS USED TO LOWER URIC ACID LEVELS

James R. Beck; Robert P. Gajewski, both of Indianapolis, and Ronald E. Hackler, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 22, 1980, Ser. No. 189,435

Int. Cl.[3] C07D *275/02;* A61K *31/425, 31/44*

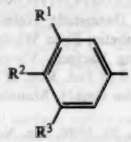
U.S. Cl. 424—270 18 Claims

1. A method for lowering the blood urate (uric acid) level in mammals which comprises the parenteral administration to a mammal having an elevated blood urate level and in need of treatment of a drug of the formula

I

wherein

Ar is pyridyl, thienyl, phenyl or



wherein at least one of R^1, R^2 and R^3 is H and the other two are individually H, CF_3, Cl, Br, F, alk or O-alk, only one of R^1, R^2 and R^3 can be I, or R^1 and R^2 or R^2 and R^3 when taken together are methylenedioxy;

X is NH_2, H, hal, OH or NH-alk;

R is OH or OM; wherein hal is Cl, F, I, or Br; alk is (C_1–C_3) alk; and M is a non-toxic cation in a quantity sufficient to lower said elevated blood urate level.

4,346,095

THERAPEUTIC TREATMENT FOR VIRAL HEPATITIS INFECTION

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215

Continuation-in-part of Ser. No. 876,618, Feb. 10, 1978, Pat. No. 4,177,281. This application Aug. 6, 1979, Ser. No. 64,072

Int. Cl.[3] A61K *31/415*

U.S. Cl. 424—273 R 4 Claims

1. A method for treating a human host having a viral hepatitis infection comprising:

(a) repeatedly orally administering anti-hepatitis viral infection effective amounts of a pharmaceutical composition which contains, as an active ingredient, 1-(B-hydroxethyl)-2-methyl-5-nitromidazole to a human host in need of said treatment.

4,346,096

ANTITUMOR AND IMMUNOSUPPRESSIVE 4-CARBAMOYL IMIDAZOLIUM-5-OLATE DERIVATIVES AND PHARMACEUTICAL COMPOSITION THEREOF

Tetsutaro Sanjiki, Ibaraki; Akinori Seta, Toyonaka, and Takao Kiyohara, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

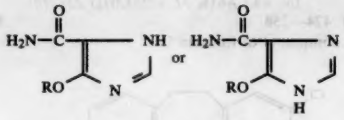
Filed Aug. 7, 1980, Ser. No. 176,241

Claims priority, application Japan, Sep. 20, 1979, 54-121783

Int. Cl.[3] C07D *233/64, 233/28, 233/66;* A61K *31/415*

U.S. Cl. 424—273 R 10 Claims

1. A compound of the formula



wherein R is a benzenesulfonyl group which may be substituted with a lower alkyl group, a lower alkoxy group, a nitro group or a halogen atom.

8. An immunosuppressant composition which comprises an amount of a compound of claim 1 as an active ingredient and a pharmaceutically acceptable carrier or diluent.

4,346,097

METHOD FOR TREATING CONVULSIONS WITH PYRAZOLE-4-CARBOXAMIDE DERIVATIVES

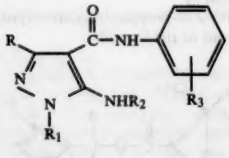
Dietrich Schweiss, and Ivan C. Nordin, both of Holland, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 30, 1980, Ser. No. 192,407

Int. Cl.[3] A61K *31/415*

U.S. Cl. 424—273 P 4 Claims

1. A method for treating convulsions in a warm blooded animal which comprises administering to said warm blooded animal an anticonvulsive effective amount of at least one compound having the structural formula:



wherein R and R_1 may be the same or different and are alkyl of from 1 to 6 carbon atoms, phenyl, or benzyl; R_2 is hydrogen or alkyl of from 1 to 6 carbon atoms, R_3 is halo, alkyl of from 1 to 6 carbon atoms, amino, alkoxy of from 1 to 6 carbon atoms, nitro, trifluoromethyl, hydroxy, $CONR_4R_5$ wherein R_4 and R_5 may be the same or different and are hydrogen or alkyl of from 1 to 6 carbon atoms, or COOA wherein A is hydrogen, alkyl of from 1 to 6 carbon atoms, or a cation of a pharmaceutically acceptable metal or an amine; and the pharmaceutically acceptable salts thereof.

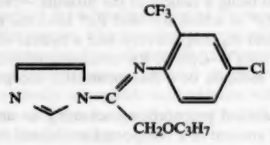
4,346,098

FUNGICIDAL COMPOSITIONS AND METHODS

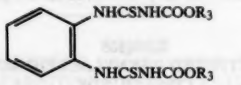
Yasushi Yasuda, Yokohama; Masami Mizuno, Yamanishi; Hiroaki Nishikawa, Ohiso, and Akira Murakami, Hiratsuka, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,452
Claims priority, application Japan, Dec. 7, 1979, 54/158108
Int. Cl.³ A01N *43/50, 43/56*
U.S. Cl. 424—273 R 4 Claims

1. A fungicidal composition for agricultural and horticultural use consisting essentially of an inert carrier and a fungicidally effective amount of a mixture of compounds (I) and (II) in a weight ratio of compound (I) and compound (II) of 80:20 to 5:95, said compounds having the following structural formulas:



(I)



(II)

wherein R_3 is an alkyl component having 1 or 2 carbon atoms.

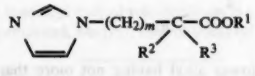
4,346,099

CARBOXY-IMIDAZOLE DERIVATIVES, COMPOSITIONS AND USE

Tadao Tanouchi, Takatsuki; Masanori Kawamura; Takanori Okada, both of Ibaraki, and Masaki Hayashi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka and Kissei Pharmaceutical Co., Ltd., Nagano, both of, Japan

Filed Sep. 22, 1981, Ser. No. 304,531
Int. Cl.³ A61K *31/415*
U.S. Cl. 424—273 R 12 Claims

1. An imidazole of the general formula:



(I)

wherein m represents an integer of 4 to 9, R^1 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, and one of R^2 and R^3 represents a hydrogen atom, and the other represents a halogen atom or a phenyl group, or R^2 and R^3 together represent $-(CH_2)_n-$, in which n represents an integer of 4 to 6, or represent $=CH_2$, or pharmaceutically acceptable non-toxic salts thereof.

11. A thromboxane A_2 inhibiting composition which comprises, as an active ingredient, an effective amount of at least one compound of the general formula (I) depicted in claim 1, wherein various symbols are as defined in claim 1, or a pharmaceutically acceptable non-toxic salt thereof, together with a pharmaceutical carrier or coating.

4,346,100

PHENOXY ACETIC ACID DERIVATIVE, ITS PREPARATION AND THERAPEUTIC USE

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Apr. 17, 1978, Ser. No. 897,287
Claims priority, application United Kingdom, Apr. 22, 1977, 16789/77
Int. Cl.³ A61K *31/38*
U.S. Cl. 424—275 1 Claim

1. A therapeutic composition comprising a choloretically effective amount of a compound selected from the group consisting of [2-isopropyl-4-(2-thenoyl)-5-methyl]-phenoxy acetic acid and alkali metal salts thereof, together with a pharmaceutically acceptable carrier therefor.

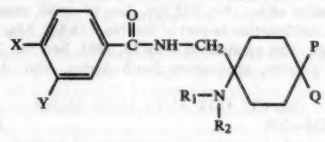
4,346,101

BENZAMIDE DERIVATIVE ANALGESICS

Daniel Lednicer, Columbus, Ohio, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 8, 1980, Ser. No. 213,963
Int. Cl.³ A61K *31/335, 31/165;* C07D *319/04;* C07C *103/22*
U.S. Cl. 424—278 23 Claims

1. A compound of the formula



wherein each of R_1 and R_2 is C_1 to C_3-alkyl,

P, taken separately, is benzyl or methyl,

Q, taken separately, when P is benzyl or methyl, is hydrogen or hydroxy, but P is not methyl when Q is hydrogen;

P and Q, taken together, complete an alkylene dioxy group selected from the group consisting of ethylenedioxy, 1,3-propylenedioxy and 1,3-propylenedioxy having one or two methyl groups on carbon two of the propylene chain;

X is selected from the group consisting of a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_3-alkyloxy or nitro; and Y is a halogen having an atomic number of from 9 to 35 or hydrogen, and Y is hydrogen when X is trifluoromethyl or nitro, and X can also be methoxy when Y is bromine, and the hydrates and pharmacologically acceptable salts thereof.

10. A composition useful in pharmaceutical dosage unit form for alleviating pain in warm-blooded mammals which comprises a pain-alleviating effective non-toxic amount of a compound of formula I in claim 1 in combination with a pharmaceutically acceptable carrier.

13. A method for alleviating pain which comprises administering to a warm-blooded animal a pain-allevating effective amount of a compound of formula I in claim 1 in a pharmaceutical dosage unit form.

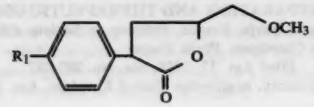
4,346,102

3H-DIHYDROFURANONE-2 DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Michel Langlois, Buc; Alain P. Lacour, La Varenne; Bernard P. Bucher, Marnes la Coquette, and Gisele C. Mocquet, Paris, all of France, assignors to Delalande S.A., Courbevoie, France

Filed Apr. 28, 1980, Ser. No. 144,075
Claims priority, application France, May 7, 1979, 79 11453
Int. Cl.³ C07D *307/32, 405/12;* A61K *31/365, 31/44*
U.S. Cl. 424—279 9 Claims

1. A compound having the formula



wherein R_1 is selected from the group consisting of 4-chlorobutoxy, 4-cyanobutoxy, benzyloxy, meta-nitrobenzyloxy, meta-chlorobenzyloxy, meta-cyanobenzyloxy, 3-pyridinylmethoxy, 3-cyano-5-nitrobenzyloxy and 3-chloro-4-fluorobenzyloxy, as a mixture of four diastereoisomers thereof, a mixture of two cis diastereoisomers thereof or a mixture of two trans diastereoisomers thereof, with the exception that a mixture of two trans diastereoisomers is excluded when R_1 is 4-chlorobutoxy or benzyloxy and that a mixture of two cis diastereoisomers and a mixture of two trans diastereoisomers are excluded when R_1 is 4-cyanobutoxy or 3-pyridinylmethoxy.

4,346,103

TREATMENT FOR ARTHRITIS AND SUBSTANCES FOR USE IN SUCH TREATMENT

Charles A. Friedmann, Quattroventi, Montefili, Creve in Chianti, Florence, Italy

Continuation of Ser. No. 112,824, Jan. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 773,406, Mar. 1, 1977, abandoned. This application May 18, 1981, Ser. No. 264,817

Claims priority, application South Africa, Mar. 16, 1976, 76/1627

Int. Cl.[3] **A61K** *31/12, 31/19, 31/235*

U.S. Cl. 424—308 **4 Claims**

1. A method of treating the symptoms of multiple sclerosis comprising administering to a person suffering therefrom an effective amount of 1,8 dialkyloxy-3-carboxy-anthraquinone or a pharmaceutically acceptable ester thereof, in which the alkyl radical is derived from an aliphatic acid having from 1 to 6 carbon atoms.

4,346,104

NOVEL SUBSTITUTED PHENYLACETIC ACID AMIDE COMPOUNDS

Alfred Sallmann, Bottmingen, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

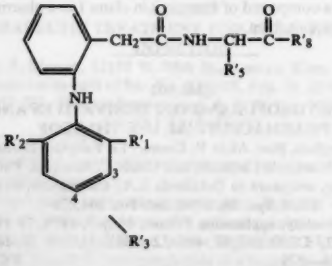
Division of Ser. No. 33,295, Apr. 25, 1979, Pat. No. 4,250,192, which is a continuation of Ser. No. 905,087, May 11, 1978, abandoned, and Ser. No. 906,292, May 15, 1978, abandoned. This application Dec. 17, 1980, Ser. No. 217,365

Claims priority, application Luxembourg, May 11, 1977, 77316

Int. Cl.[3] **C07C** *101/447;* **A61K** *31/24, 31/195;* **C07C** *103/29*

U.S. Cl. 424—309 **12 Claims**

1. A compound of the formula



(III)

in which R_1' is lower alkyl having not more than 4 carbon atoms or halogen having an atomic number of not more than 35, R_2' is hydrogen, lower alkyl having not more than 4 carbon atoms or halogen having an atomic number of more than 35 and R_3' is hydrogen, with the proviso that R_3' can also be lower alkyl having not more than 4 carbon atoms, in the 3-position, if R_1' is one of the said halogen atoms and R_2' is hydrogen, or with the proviso that R_3' can also be halogen having an atomic number of not more than 35, in the 4-position, if R_1' is one of the said halogen atoms and R_2' is hydrogen, and R_5' is lower alkyl having not more than 4 carbon atoms, which is substituted by mercapto, lower alkylthio having not more than 4 carbon atoms, or S'-substituted dithio, the second sulfur atom in the S'-substituted dithio group containing, as a substituent, the radical of a compound of the formula III which is bonded via the grouping R_5' and in which R_1', R_2' R_3', R_5' and R_8' are as defined, and R_8' is hydroxyl, lower alkoxy having not more than 4 carbon atoms or substituted or unsubstituted amino, substituted amino being a radical of the formula —NH—CH($R_5^{a'}$)—C(=O)-$R_8^{a'}$ in which $R_5^{a'}$ and $R_8^{a'}$ have the meanings defined for R_5' and R_8' respectively, and a radical of the formula —NH—CH(R_5')—C(=O)-R_8' consisting of one, two or three aminoacid radicals, or a therapeutically acceptable salt thereof.

9. A pharmaceutical preparation containing an antiinflammatory effective amount of a compound as claimed in claim 1 together with conventional pharmaceutical excipients.

4,346,105

NOVEL SUBSTITUTED PHENYLACETIC ACID AMIDE COMPOUNDS

Alfred Sallmann, Bottmingen, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

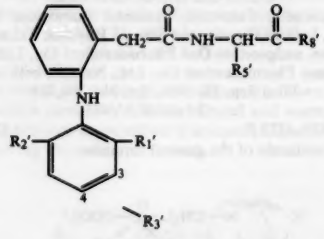
Division of Ser. No. 33,295, Apr. 25, 1979, Pat. No. 4,250,192, which is a continuation of Ser. No. 905,087, May 11, 1978, abandoned, and Ser. No. 906,292, May 15, 1978, abandoned. This application Dec. 17, 1980, Ser. No. 217,366

Claims priority, application Luxembourg, May 11, 1977, 77316

Int. Cl.[3] **C07C** *101/447;* **A61K** *31/24, 31/195;* **C07C** *103/29*

U.S. Cl. 424—309 **12 Claims**

1. A compound of the formula



in which R_1 is lower alkyl having not more than 4 carbon atoms or halogen having an atomic number of not more than 35, R_2' is hydrogen, lower alkyl having not more than 4 carbon atoms or halogen having an atomic number of not more than 35 and R_3 is hydrogen, with the proviso that R_3' can also be lower alkyl having not more than 4 carbon atoms, in the 3-position, if R_1' is one of the said halogen atoms and R_2' is hydrogen, or with the proviso that R_3' can also be halogen having an atomic number of not more than 35, in the 4-position, if R_1' is one of said halogen atoms and R_2' is hydrogen, and R_5' is lower alkyl having not more than 4 carbon atoms substituted by hydroxyl or lower alkoxy, and R_8' is hydroxyl, lower alkoxy having not more than 4 carbon atoms or substituted or unsubstituted amino, substituted amino being a radical of the formula —NH—CH($R_5^{a'}$)—C(=O)—$R_8^{a'}$, in which $R_5^{a'}$, and $R_8^{a'}$ have the meanings for R_5' and R_8' respectively, and a radical of the

formula —NH—CH(R_5')—C(=O)—R_8' consisting of one, two or three aminoacid radicals, or a therapeutically acceptable salt thereof.

4. A pharmaceutical preparation containing an antiinflammatory effective amount of a compound as claimed in claim 1 together with conventional pharmaceutical excipients.

4,346,106

METHOD FOR INHIBITING ONSET OF MIGRAINE HEADACHES WITH NADOLOL COMPOSITIONS

Abraham Sudilovsky, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 263,656, May 14, 1981, abandoned. This application Jun. 25, 1981, Ser. No. 277,378
Int. Cl.³ A61K *31/22, 31/135*
U.S. Cl. 424—311 6 Claims

1. A method for inhibiting onset of migraine headaches in a mammalian species which comprises systemically administering to a mammalian host susceptible to migraine headaches and in need of such treatment nadolol or an ester thereof or a pharmaceutically acceptable acid-addition salt of said nadolol or ester thereof in a dosage of from about 60 to about 240 mg in a single dose per day.

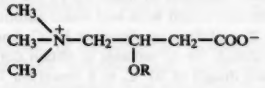
4,346,107

PHARMACEUTICAL COMPOSITION COMPRISING ACYL-CARNITINE FOR THE TREATMENT OF IMPAIRED CEREBRAL METABOLISM

Claudio Cavazza, 35, Via Marocco, 00144 Rome, Italy, and Menotti Calvani, Rome, Italy, assignors to Claudio Cavazza, Rome, Italy

Filed Feb. 5, 1980, Ser. No. 119,075
Claims priority, application Italy, Feb. 12, 1979, 47976 A/79; Nov. 9, 1979, 50795 A/79
Int. Cl.³ A61K *31/205*
U.S. Cl. 424—316 3 Claims

1. A therapeutic method for the treatment of a patient affected by impaired cerebral metabolism, senile and presenile psychomotor involution, depressive states, senile and presenile dementia, decreased cerebral blood flow, sequelae of cerebral stroke, cerebral ischaemias, and primary impaired cerebral metabolism, comprising administering via the oral or parenteral route to said patient a therapeutically effective amount of an acyl-carnitine of the formula:



(I)

wherein R is an acyl radical selected from the group consisting of acetyl, propionyl, butyryl, hydroxybutyryl and acetoacetyl.

4,346,108

METHOD FOR PREVENTING ADHESION FORMATION

Adam Singer, Englishtown, N.J., assignor to The Upjohn Manufacturing Company M, P.R.

Filed Jun. 22, 1981, Ser. No. 275,871
Int. Cl.³ A61K *31/19*
U.S. Cl. 424—317 2 Claims

1. A process for preventing or reducing adhesion formation comprising the systemic administration to a human or animal of an effective adhesion preventing or reducing amount of p-isobutylhydraptropic acid or an alkyl ester of from 1 to 8 carbon atoms, inclusive, including isomeric forms thereof, or a pharmacologically acceptable salt thereof; said human or animal having an adhesion inducing trauma to its tissue.

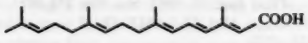
4,346,109

METHOD OF TREATING KERATOTIC SKIN DISEASE

Isao Yamatsu, Kawaguchi; Yuichi Inai, Tokyo; Shinya Abe, Kawagoe; Takeshi Suzuki, Abiko; Yoshikazu Suzuki, Ichinomiya; Osamu Tagaya, Gifu, and Nozomu Koyanagi, Niiza, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 249,290
Claims priority, application Japan, Jul. 31, 1980, 55-104420
Int. Cl.³ A61K *31/20*
U.S. Cl. 424—318 6 Claims

1. A method for the treatment of skin disease with keratinization, which comprises administering to a subject requiring such treatment a therapeutically effective amount of 3,7,11,15-tetramethyl-2,4,6,10,14-hexadecapentaenoic acid of the formula:



or a pharmaceutically acceptable salt thereof.

4,346,110

METHOD FOR TREATING DEPRESSION

Michael G. Palfreyman, Fegersheim, and Ian A. McDonald, Truchtersheim, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jun. 1, 1981, Ser. No. 268,554
Int. Cl.³ A61K *31/24, 31/195*
U.S. Cl. 424—319 3 Claims

1. A method for treating depression which comprises administering to a depressed patient an antidepressant effective amount of 2-amino-3-(3'-hydroxyphenyl)-3-butenoic acid or 2-amino-3-(3',4'-dihydroxyphenyl)-3-butenoic acid, or a C_1–C_8 alkyl ester, or a pharmaceutically acceptable salt thereof.

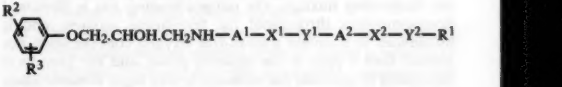
4,346,111

ALKANOLAMINE DERIVATIVES

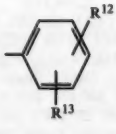
Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 98,933, Nov. 30, 1979, Pat. No. 4,318,921, which is a division of Ser. No. 839,568, Oct. 5, 1977, Pat. No. 4,211,878. This application Dec. 12, 1980, Ser. No. 215,874
Claims priority, application United Kingdom, Oct. 7, 1976, 41714/76
Int. Cl.³ A61K *31/165;* C07C *121/50, 103/19*
U.S. Cl. 424—324 10 Claims

1. An alkanolamine derivative selected from the group consisting of a compound of the formula:



wherein A^1 is alkylene of from 2 to 6 carbon atoms; wherein A^2 is a direct link or alkylene of up to 6 carbon atoms; wherein R^1 is hydrogen, or alkyl halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro, carbamoyl, cyano or alkyl, alkenyl, alkoxy, alkylthio, alkenyloxy, alkanoyl or acylamino each of up to 6 carbon atoms, or wherein R^2 and R^3 together and/or R^{12} and R^{13} together, form

trimethylene, tetramethylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl or naphthyl; wherein X^1 is amidic of the formula —NHCO— and X^2 is amidic of the formula —CONH—; wherein Y^1 is a direct link and wherein Y^2 is a direct link, or alkylene or alkyleneoxy each of up to 6 carbon atoms, and the non-toxic pharmaceutically-acceptable acid-addition salts thereof.

4,346,112

COMPOSITION AND METHOD FOR TREATING PATIENTS HAVING PARKINSON'S DISEASE

James G. Henkel, Manchester, and Gerald Gianutsos, Tolland, both of Conn., assignors to University Patents Inc., Norwalk, Conn.

Filed Jun. 29, 1981, Ser. No. 278,687
Int. Cl.³ A61K *31/13*
U.S. Cl. 424—325 **2 Claims**

1. The process of treating an animal afflicted with Parkinson's Disease which comprises administering to the animal between about 2 and about 7 mg/kg 3-ethyl-1-aminoadamantane in an amount effective to control the undesirable side effects of Parkinson's Disease and a pharmaceutically acceptable carrier.

4,346,113

PROCESS FOR THE CONTINUOUS FERMENTATION OF AQUEOUS SLURRIES FOR THE PRODUCTION OF ALCOHOL AND YEAST BIOMASS

Uwe Faust, Fischbach; Paul Präve, Neuenhain; Beate Dorsemagen, Frankfurt, and Norbert Hofer, Eppstein, all of Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,345
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938339
Int. Cl.³ C12P *7/06;* C12G *3/02*
U.S. Cl. 426—12 **4 Claims**

1. In a continuous process for the production of alcohol and yeast biomass by reaction in a uniform fermenting mixture of a sugar-bearing, aqueous slurry, starter yeast, yeast nutrients and an oxygen-bearing gas, the process comprising the steps of continuously withdrawing from the fermenting mixture a yeast- and alcohol-bearing wort which forms therein and separating from the withdrawn wort an alcohol-bearing medium, while continuously feeding to the mixture fresh aqueous slurry, the starter yeast, the yeast nutrients and the oxygen-bearing gas, the improvement wherein the yeast is a flocculating, bottom yeast, the portion of the wort which remains after separation of the alcohol-bearing medium therefrom, is recycled to the fermenting mixture, the oxygen-bearing gas is dispersed homogeneously throughout the fermenting mixture, and is introduced to maintain a mean-free oxygen concentration not greater than 1 ppm in the aqueous phase, and the process is controlled to maintain the measurable free sugar concentration in the fermenting mixture at a level which does not exceed 0.1 percent by weight, and to maintain the active yeast concentration in the fermenting mixture between 100 and 110 percent of the specific degree of fermentation.

4,346,114

SOY SAUCE FROM TEAR GRASS AND PROCESS FOR PRODUCTION THEREOF

Yoshihide Hagiwara, Takarazuka, Japan, assignor to Japan Natural Food Co. Ltd., Osaka, Japan

Continuation of Ser. No. 109,638, Jan. 4, 1980, abandoned. This application Feb. 25, 1981, Ser. No. 237,871
Claims priority, application Japan, Jan. 12, 1979, 54/1227
Int. Cl.³ A23L *1/238*
U.S. Cl. 426—18 **8 Claims**

1. A process for producing a tear grass soy sauce, which comprises inoculating a koji mold for soy sauce in a koji substrate comprising a denatured proteinous material and a denatured carbohydrate material, at least 10% by weight based on the weight of said carbohydrate material being tear grass, cultivating the koji mold to form a koji for soy sauce, said cultivation being started at a pH of about 4.0 to about 8.0 and a temperature of from room temperature to about 40° C. adding water and sodium chloride to the koji to prepare moromi, fermenting the moromi, said fermentation being started at a pH of about 3 to about 7 and a temperature of from room temperature to about 40° C. and separating the liquid layer from the fermentation product.

4,346,115

FERMENTATION OF ACID-CONTAINING DOUGHS

Philippe Clement, Roubaix, and Jean-Paul Rossi, Marcq En Baroeul, both of France, assignors to Lesaffre et Cie, Paris, France

Filed Dec. 23, 1977, Ser. No. 863,950
Claims priority, application United Kingdom, Dec. 24, 1976, 54174/76
Int. Cl.³ A21D *2/14;* C12C *11/16;* C12N *1/18*
U.S. Cl. 426—25 **7 Claims**

7. An active dry baker's yeast composition containing an emulsifying agent and having more than 92% of dry matter for use in fermenting sour dough on dough containing an acid mold inhibitor or salt thereof, and wherein said dry yeast composition

(a) yields more than 38 ml in test A'_5 in one hour,

wherein, in said test A'_5 160 mg of dry matter of said dry yeast, which has been rehydrated in distilled water, at 38° C. with 40% of the volume of hydration used therefor, for 15 minutes, and thereafter adding thereto 0.15 ml of a mixture of 15 g of acetic acid and 80 g of lactic acid together with an amount of water containing 405 mg of NaCl, required to make up 15 ml, the yeast so rehydrated and mixed with said water additions is then added to 20 g of flour incubated at 30° C., kneading the resulting dough for 40 seconds to obtain dough, maintaining said dough at 30° C. in a vessel for 13 minutes after the beginning of said kneading, thereafter hermetically sealing said vessel and measuring the total amount of gas produced, in ml, at 30° C. and 760 mm of Hg, after the expiration of 60 minutes; and

(b) yields more than 820 ml in test B'_3 in 3 hours,

wherein, in said test B'_3 1.6 g of yeast dry material is rehydrated at 38° C. with 50 ml of distilled water for 15 minutes, and at the end of said 15 minutes there is added thereto 2 ml of a mixture of 15 g of acetic acid and 80 g of lactic acid, with the remaining complement of water, i.e., 98 ml of water containing 5 g of salt, required to make up 150 ml total, the resulting yeast/water/salt/acid mixture being then added to 250 g of flour, and the resulting mixture is then kneaded for 6 minutes, so that the temperature of the resulting dough at the end of said kneading is 27° C., placing the dough in the chamber of a Chopin zymotachygraph, and exactly 6 minutes after said kneading, said chamber is placed under pressure and maintained at 27° C., and recording the total release of gas, in ml, on a graph after the expiration of 3 hours.

4,346,116

NON-CARIOGENIC HYDROGENATED STARCH HYDROLYSATE, PROCESS FOR THE PREPARATION AND APPLICATIONS OF THIS HYDROLYSATE

Francoise Verwaerde; Jean-Bernard Leleu, and Michel Huchette, all of Lestrem, France, assignors to Roquette Freres, France

Continuation-in-part of Ser. No. 38,711, May 14, 1979, Pat. No. 4,279,931. This application May 21, 1980, Ser. No. 151,816
Claims priority, application France, Dec. 11, 1978, 78 34830; Ireland, Dec. 4, 1979, 2322/79
The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.
Int. Cl.[3] A23L *1/09;* C13K *7/00*
U.S. Cl. 426—48 14 Claims

1. Non-cariogenic hydrogenated starch hydrolysate comprising:

less than 3% by weight of polyols of DP higher than 20,

35 to 60% by weight of maltitol,

0.1 to 19% by weight of sorbitol

the balance up to 100 consisting essentially of polyols of DP 3 to 20.

4,346,117

METHOD FOR INHIBITING THE GROWTH OF *CLOSTRIDIUM BOTULINUM* AND THE FORMATION OF ENTEROTOXIN IN CORNED BEEF AND POULTRY AND PRODUCTS THEREOF

John S. Thompson, Wayne, Pa., and Joseph F. Jadlocki, Jr., Mount Holly, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 207,566, Nov. 17, 1980, which is a continuation-in-part of Ser. No. 184,689, Sep. 8, 1980, Pat. No. 4,277,507, which is a continuation-in-part of Ser. No. 140,328, Apr. 14, 1980, Pat. No. 4,282,260. This application Jul. 6, 1981, Ser. No. 280,192
The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.
Int. Cl.[3] A23B *4/02;* A23L *1/31, 1/315*
U.S. Cl. 426—264 17 Claims

1. A food product, that is resistant to the outgrowth of *Clostridium botulinum* and the formation of enterotoxins during storage of said food product, selected from the group consisting of corned beef and smoked poultry, said food product containing an alkali metal nitrite salt, in an amount less than about 120 ppm, and a compound selected from the group consisting of hypophosphorous acid and its nontoxic water-soluble salts in an amount effective to inhibit production of enterotoxin from *Clostridium botulinum* during storage of said food product.

10. A method of inhibiting the production of enterotoxin from *Clostridium botulinum* and, upon cooking, inhibiting formation of nitrosamines from nitrite salt in corned beef and smoked poultry which comprises the step of adding thereto an alkali metal nitrite salt, in an amount less than about 120 ppm, and a compound selected from the group consisting of hypophosphorous acid and its nontoxic water-soluble salts in an amount effective to inhibit production of enterotoxin from *Clostridium botulinum* during storage of the meat.

4,346,118

ANTIMICROBIAL AGENTS ADDED TO ANIMAL FEEDS

Mir N. Islam, Newark, Del., assignor to University of Delaware, Newark, Del.

Filed May 2, 1980, Ser. No. 146,322
Int. Cl.[3] A23L *3/34*
U.S. Cl. 426—335 1 Claim

1. A process of protecting poultry or animal feed by diminishing the growth of aflatoxin producing mold during the storage of the feed which comprises incorporating in said feed a dialkyl ester of fumaric acid in an amount of at least 0.2% by weight of the feed and wherein the alkyl groups of the dialkyl ester are methyl, ethyl or propyl groups.

4,346,119

PROCESS FOR THE PREPARATION OF INSTANT COOKING ALIMENTARY PASTE

Ennio Braibanti, Milan, Italy, assignor to Dott. Ing. M., G. Braibanti & C. S.p.A., Italy

Filed Dec. 5, 1980, Ser. No. 213,699
Claims priority, application Italy, Mar. 10, 1980, 20483 A/80
Int. Cl.[3] A23L *1/16*
U.S. Cl. 426—451 7 Claims

1. A method of preparing instant-cooking alimentary paste, comprising the following steps:

(a) introducing a mixture of cereal flour and water into an extrusion zone to form a paste, and steam-treating said paste coming from the extrusion zone and having a moisture content of about 25–35%, using steam at a temperature of at least about 95° but no greater than 100° C., at atmospheric pressure, and for a time sufficient to effect only partial gelatinization of said extruded paste;

(b) wetting the partially gelatinized paste to increase the moisture content to approximately 40% to 55%,

(c) allowing the so-wetted paste to stand for a time sufficient to permit the moisture to become substantially evenly distributed in said paste;

(d) steam-treating said paste treated from stage (c), with steam at a temperature of at least about 95° but no greater than 100° C., at atmospheric pressure to effect further gelatinization and cooking thereof.

4,346,120

FROZEN DESSERT PRODUCT

Robert G. Morley, Stone Mountain, and W. Ronald Ashton, Duluth, both of Ga., assignors to Landwide Foods, Inc., Dover, Mass.

Filed Nov. 26, 1980, Ser. No. 210,846
Int. Cl.[3] A23G *9/02*
U.S. Cl. 426—565 19 Claims

1. A frozen dessert product

A. characterized at least in part by being extrudable and coneable at near 0° F. for serving by extrusion at home freezer temperatures,

B. consisting essentially, by weight in the absence of significant weight by flavorings, of

(1) edible triglycerides in a range from 5% to 15%,

(2) protein in a range from 3% to 5%,

(3) water in a range of 46% to 60%,

(4) saccharides in a range from 20% to 40%, and including plural saccharides selected from the group consisting of sorbitol, fructose, dextrose, corn syrup, mannitol and sucrose,

(5) stabilizers in a range from 0.25% to 1.3% and including at least a first stabilizer selected from the group consisting of guar gum, locust bean gum, tara gum, propylene glycol alginate, sodium carboxymethyl cellulose, and other cellulose ethers; a second stabilizer selected from the group consisting of microcrystalline cellulose and cellulose fibers; and a third stabilizer selected from the group consisting of gelatin, xanthan gum, carrageenan, pectin and sodium alginate, and

(6) emulsifiers in a range from 0.2% to 0.8% and including at least a first emulsifier selected from the group consisting of mono- and diglycerides and distilled monoglycerides, and a second emulsifier selected from the group consisting of polysorbate 65, polysorbate 80, and ethoxylated monoglycerides, and

C. having a specific gravity in the range of between 0.36 and 0.54.

4,346,121
PROCESS FOR PREPARING CRUMB PRODUCTS

Sandor Turos, Gamla Särövägen 113, S-436 00 Askim, Sweden

PCT No. PCT/SE80/00081, § 371 Date Nov. 3, 1980, § 102(e) Date Nov. 3, 1980, PCT Pub. No. WO80/01869, PCT Pub. Date Sep. 18, 1980
PCT Filed Mar. 17, 1980, Ser. No. 227,882
Claims priority, application Sweden, Mar. 16, 1979, 7902399
Int. Cl.³ A23G 1/00
U.S. Cl. 426—580 12 Claims

1. A process for manufacturing crumb products, which comprises preparing a first raw material flow F1 containing component f1 and one or more flows f2–f4 wherein

f1 contains liquid milk or milk products selected from the group consisting of completely or partly defatted fresh milk, defatted or whole condensed milk, whey, completely or partly desalted whey, butter milk, casein or caseinate, whey protein concentrate and combinations thereof, having a dry solids content of 20–27% by weight, suitably at a temperature of about 50° C.;

f2 contains sugar raw materials in the form of tetroses, pentoses, hexoses selected from the group consisting of glucose, fructose, and galactose, sugar alcohols exemplified by sorbitol, disaccharides selected from the group consisting of lactose, maltose, and dextromaltose, partially hydrolyzed starch, syrup products, xylitol or different combinations thereof, suitably in an aqueous solution;

f3 contains dry protein raw materials selected from the group consisting of vegetable protein, dry milk solids, whey powder, butter milk powder, which suitably are admixed with water and treated in in a colloid mill, having the same dry solids contents as stated for f1;

f4 contains one or more amino acids, which may be in combination with one or more reducing sugars, suitably in an aqueous solution;

and a second flow F2 consisting of flow f5 and may contain flow f6, of which

f5 contains fatty components selected from the group consisting of cream, suitably with a fat content of 12–35% by weight, butter, butter oil, other vegetable and/or animal fat products or fat-containing products and mixtures thereof;

f6 consists of an emulsifier for the fat phase, which promotes the formation of emulsions of the type oil-in-water, exemplified by glyceryl monostearate;

and wherein the flow F1 having a dry solids content of 20–70% by weight and a pH in the range 4–8 is heat-treated at a temperature of 100°–130° C. during a period of time of about 7–2 minutes for performing a Maillard reaction, and subsequently is cooled to a temperature of about 80°–95° C.; whereupon the flows F1 at the said temperature and F2 at a temperature of about 65°–75° C. are metered into an emulsifying vessel to the formation of an emulsion of F2 in F1, which emulsion after an adjustment of the water content, if required, is submitted to a homogenizing treatment in a homogenizer, whereupon the crumb emulsion formed is used directly.

4,346,122
LOW-VISCOSITY, HIGH-NSI, HEAT-GELLING SOY ISOLATES

Frank T. Orthoefer, Decatur, Ill., and Lynn V. Ogden, Pleasanton, Calif., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

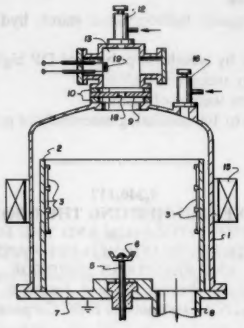
Filed Dec. 29, 1980, Ser. No. 220,590
Int. Cl.³ A23J 1/14, 3/02
U.S. Cl. 426—656 20 Claims

1. A dry vegetable protein isolate useful for preparing imitation cheese products, said isolate characterized as: (a) having an NSI of at least 90, (b) substantially free from vegetable protein hydrolyzates, (c) forming an insoluble gel when dissolved in water at a 15% by weight protein isolate concentration and heated to 85° C. for 30 minutes, and (d) yielding an aqueous isolate solution viscosity of less than 100,000 cps when reconstituted with water at 22° C. and a 15% by weight (d.s.b.) isolate concentration.

4,346,123
METHOD OF DEPOSITING HARD WEAR-RESISTANT COATINGS ON SUBSTRATES

Helmut Kaufmann, Triesen, Liechtenstein, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Aug. 1, 1980, Ser. No. 174,610
Claims priority, application Switzerland, Aug. 2, 1979, 7092/79
Int. Cl.³ C23C 11/14
U.S. Cl. 427—38 4 Claims



1. A method of depositing a hard wear-resistant coating onto a substrate comprising:

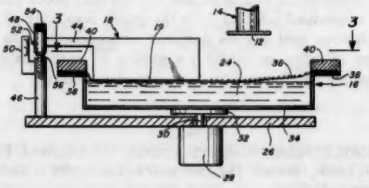
evaporating a metal in a nitrogen containing residual gas atmosphere to form the coating on the substrate; and simultaneously forming an electric gas discharge in the atmosphere to activate the residual gas; wherein

the atmosphere simultaneously contains nitrogen, oxygen and carbon with the atomic number proportion of oxygen to carbon being between about 0.5 to 1.5; and wherein the metal is selected from the group which consists of titanium, zirconium and hafnium.

4,346,124
METHOD OF APPLYING AN ADHESIVE TO A CIRCUIT CHIP

Laurier A. Wood, Amherst, and Donald N. Humphries, Bedford, both of N.H., assignors to Laurier Associates, Inc., Hudson, N.H.

Filed May 4, 1981, Ser. No. 259,854
Int. Cl.³ H01L 21/58
U.S. Cl. 427—82 2 Claims



1. A method of applying a liquid glue to the surface of a circuit chip in which a bath tray is employed having a mesh screen disposed in the bath tray above the liquid glue level, said method comprising the steps of; providing a leveling paddle extending into the tray, causing relative rotation between the leveling paddle and the bath tray with the paddle

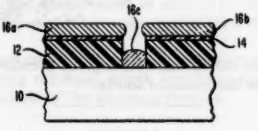
sweeping across the screen to dip the screen into the liquid glue material, at the same time smoothing the glue over the screen, thereafter, pressing the circuit chip onto the mesh screen to receive the application of glue onto the circuit chip.

4,346,125

REMOVING HARDENED ORGANIC MATERIALS DURING FABRICATION OF INTEGRATED CIRCUITS USING ANHYDROUS HYDRAZINE SOLVENT

Eliezer Kinsbron, Highland Park, and Frederick Vratny, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1980, Ser. No. 214,171
Int. Cl.³ H01L 21/70
U.S. Cl. 427—96 12 Claims



1. A method of fabricating an IC device, comprising the steps of

forming in a multi-layered device structure a hardened pattern of organic material to cover all but selected surface portions of said device structure,

processing said selected surface portions utilizing said hardened pattern as a mask therefor,

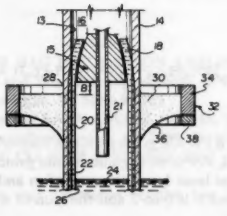
and, subsequent to said processing step, removing said hardened pattern by applying to said device structure a formulation that comprises anhydrous hydrazine.

4,346,126

METHOD OF CASTING A REVERSE OSMOSIS OR ULTRAFILTRATION POLYMERIC MEMBRANE

Oleh Kutowy, North Gower; William L. Thayer, and Srinivasa Sourirajan, both of Ottawa, all of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Continuation-in-part of Ser. No. 179,103, Aug. 18, 1980, abandoned. This application May 11, 1981, Ser. No. 262,686
Claims priority, application Canada, Sep. 13, 1979, 336704
Int. Cl.³ B05D 5/00, 7/22
U.S. Cl. 427—209 5 Claims



1. In a method of casting a reverse osmosis or ultrafiltration, polymeric membrane on a wall of a porous support having a first side which will be subjected to a relatively high liquid pressure when in use, and a second side which will be subjected to a relatively low liquid pressure when in use, wherein the porous support is coated on the first side with a cellulose ester, solvent carrier, casting solution to at least partially impregnate the porous support from the first side, the solvent carrier is partially evaporated from the cellulose ester, solvent carrier coating to leave a cellulose ester residue impregnation in the porous support, then the cellulose ester residue adjacent the first and second sides is gelled with a gelation liquid comprising a monohydric alcohol, and then the gelation liquid is removed, the improvement comprising gelling the cellulose ester residue adjacent the first side with a gelation liquid which is separate from the gelation liquid used to gel the cellulose ester residue adjacent the second side, the monohydric alcohol mole fractions of the separate gelation liquids and the temperatures of the separate gelation liquids during gelation being chosen so that relatively larger pores are gelled in the cellulose ester residue adjacent the second side compared to those in the cellulose ester residue adjacent the first side by the different gelation conditions.

4,346,127

PROCESS FOR PREPARING ABSORBING MOP MATERIAL OF NON-WOVEN FIBRES AND POLYMERIC BINDER

Antonio Ruvolo, Olgiate Olona, and Vincenzo Massa, Milan, both of Italy, assignors to Montedison S.p.A., Italy

Continuation of Ser. No. 912,834, Jun. 5, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 106,049
Claims priority, application Italy, Jun. 6, 1977, 24388 A/77
Int. Cl.³ B05D 5/00
U.S. Cl. 427—244 9 Claims

1. A process for preparing an absorbing mop material having a weight ranging from 100 to 750 g/m² comprising a substratum of non-woven fibers and a flexible, porous polymeric binder, said process comprising:

preparing a non-woven web of unbonded textile fibers consisting of essentially a cellulosic material, said web having a weight of from about 50 to about 300 g/m²;

preparing a polymeric aqueous dispersion containing

(a) from about 15 to about 60 parts, by weight, per 100 parts by weight of the dispersion, of a thermo-coaguable polymer of the type generally used as a binder for textile fibers, and

(b) from about 0.2 to about 8 parts, by weight, per 100 parts by weight of the dispersion, of a coagulating agent suitable for the thermo-coagulation of the polymeric binder at a temperature between 40° and 90° C;

adding to the aqueous dispersion an expanding agent consisting of a liquid having a boiling point of 30° C. to 80° C. that exerts no dissolving or swelling action on the polymeric binder, in an amount from about 20% to about 120%, by weight, with respect to the weight of the polymeric binder;

impregnating said web with the polymeric aqueous dispersion to which the expanding agent has been added;

subjecting the impregnated web to a heat treatment at 40° C. to 90° C. in order to bring about the coagulation of the polymeric aqueous dispersion and the evaporation of the expanding agent;

washing the web with water; and

drying said web and partially crosslinking the polymeric binder of said web by subjecting the web to a further heat treatment, at a temperature equal to or higher than 100° C.

4,346,128

TANK PROCESS FOR PLATING ALUMINUM SUBSTRATES INCLUDING POROUS ALUMINUM CASTINGS

David M. Loch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 135,679, Mar. 31, 1980, abandoned. This application May 19, 1981, Ser. No. 265,099
Int. Cl.³ C23C 3/02
U.S. Cl. 427—328 18 Claims

1. The process of plating an aluminum substrate comprising the steps of:

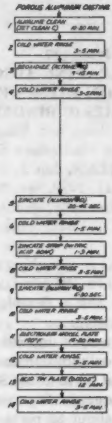
(a) cleaning the substrate;

(b) immersing the substrate in a room temperature, low pH, dilute acid bath containing an acidic fluoride-containing

salt so as to remove surface contaminants from the substrate while subjecting the substrate to only minimal etching;

(c) immersing the substrate in a first dilute zincate bath having a zinc concentration on the order of 1.1 oz./gal. to apply a first protective coating of zinc thereon;

(d) soaking the substrate in an acid bath for from 1–3 minutes to remove the first protective coating of zinc from the substrate and to apply a uniform oxide coating thereon for reducing subsequent zinc deposition rates;



(e) immersing the substrate in a second dilute zincate bath having a zinc concentration on the order of 1.1 oz./gal. to apply a second protective coating of zinc thereon;

(f) applying a non-porous barrier layer to the second protective coating of zinc by immersion of the zinc coated substrate in a heated bath containing a metal plating solution; and,

(g) applying a conductive metal outer plate to the non-porous barrier layer by immersing the substrate in a metal plating bath.

4,346,129

METHOD AND APPARATUS FOR THICKNESS CONTROL OF A COATING

Charles E. Decker, Canton, and John L. Hostetler, North Canton, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 2, 1981, Ser. No. 239,697
Int. Cl.³ B05C *3/12*; B05D *3/04*
U.S. Cl. 427—348 **13 Claims**

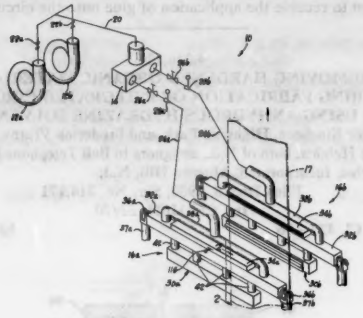
3. In a method of controlling the thickness of a coating applied to a moving strip, the steps comprising:

directing a flow of fluid under pressure to the surface of a moving strip through an air knife extending across a width of the strip at a first location to modify the coating thickness;

applying a diffused flow of fluid to the same surface of the moving strip across the width of the strip at a second location subsequent to the first location in the direction of strip travel, to chill the coating;

supplying said two flows of fluid from a common fluid source; and

controlling a proportion of the flow of the fluid from the common source that is applied as a diffused flow at the second location to establish a desired pressure and flow of



fluid from the air knife for a given pressure and flow of fluid from the common source.

4,346,130

APPLICATION OF DURABLE, ANTISTATIC, SOIL RELEASE AGENT

Alfred Tropea, Gibbstown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 229,105, Jan. 28, 1981, abandoned. This application Aug. 20, 1981, Ser. No. 294,788
Int. Cl.³ B05D *3/02*; B32B *27/00*; D04H *1/58*; C08G *12/30*
U.S. Cl. 427—393.1 **19 Claims**

1. Process for applying durable, antistatic soil release agent to a substrate, said agent being of the formula

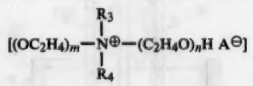
wherein

X is an aminoplast resin moiety having amino nitrogen atoms and 4 to 6 methylene groups, each of which methylene groups is attached to an amino nitrogen atom and to the extent that any such methylene groups are not attached to Y_1, Y_2, or Y_3 they are attached to a $-OCH_3$ group;

Y_1 is $O(C_2H_4O)_{5\text{-}20}R_1$ wherein R_1 is $C_{1\text{-}5}$ alkyl;

Y_2 is $O(C_2H_4O)_{5\text{-}88}R_2$ wherein R_2 is $C_{6\text{-}20}$ alkyl;

Y_3 is



wherein R_3 is $C_{4\text{-}20}$ alkyl, $C_{4\text{-}20}$ alkenyl or benzyl, R_4 is $C_{1\text{-}4}$ alkyl, $A^{\ominus}$ is an organic or inorganic anion, each of m and n is at least 1 and the sum of m and n is 12 to 100;

each of a and b is 0 to 2 and the sum of a and b is 0 to 2;

c is 1 to 2;

the sum of a, b and c is 1 to 4;

said agent having a calculated hydrophile-lipophile balance (HLB) of 14.5 to 18.0, a 20 weight % aqueous solution viscosity, as measured at 20° C. on a Brookfield viscometer, of 0.250 to 16.000 pascal seconds, an electrical resistivity (Keithley Log R) on polyester fabric, at 20±2% relative humidity and 23°±1° C. of no greater than 13.00 initially and no greater than 14.25 after ten washes, and a soil release rating on polyester fabric of at least 3 initially, said process comprising the steps:

(a) diluting the agent with water to achieve the desired concentration and viscosity,

(b) adding sufficient salt of a mono-, di- or trivalent metal or of an ammonium cation to achieve a cloud point (measured as described herein), of the diluted agent of step (a), of less than 100° C. but greater than 25° C., or adding sufficient polyacidic compound having a second dissociation constant of greater than 1×10^{-8} to achieve a pH of the diluted agent of step (a) of 3.0 to 6.0, or adding both said salt and said polyacidic compound to achieve said cloud point and pH,

(c) adding from about 0.07 to 0.8% wt % on weight of fabric of an anionic surfactant selected from the class consisting of alkyl sulfates containing from 12 to 22 carbon atoms, alkyl sulfonates containing from 12 to 24 carbon atoms and alkaryl sulfonates containing 3 to 16 alkyl carbon atoms and phenylene or naphthylene as the aromatic moiety,

(d) further diluting the agent to the desired application concentration,

(e) applying the diluted agent of step (c) to the substrate to be treated so as to achieve the desired level of agent on the substrate,

(f) drying and curing the agent on the substrate, and

(g) recovering substrate which has been durably treated with the agent of the aforesaid formula.

4,346,131

POLYMERIZED SOLUTIONS FOR DEPOSITING OPTICAL OXIDE COATINGS

Bulent E. Yoldas, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 65,706, Aug. 10, 1979, abandoned, which is a continuation of Ser. No. 931,346, Aug. 8, 1978, abandoned. This application Sep. 23, 1980, Ser. No. 189,868

Int. Cl.³ B32B *1/00, 17/06*

U.S. Cl. 428—35 **12 Claims**

1. A substrate having an oxide coating thereon which has a predetermined index of refraction between about 1.4 and about 2.4 made by

(A) preparing a clear solution which comprises:

(1) alkoxide having the general formula $M(OR)_n$ where M is selected from the group consisting of 0 to 100% Ti, 0 to 25% Si, 0 to 100% Ta, and up to 15% of a metal ion which forms an alkoxide, R is alkyl from C_1 to C_6, and n is the valence of M;

(2) about 1.7 to about 4 moles of water per mole of alkoxide;

(3) sufficient alcohol to give a solids content of about 0.1 to about 15% and

(4) a sufficient amount of a suitable acid to prevent cloudiness;

(B) applying said clear solution to said substrate; and

(C) heating said substrate to about 300° to about 600° C.

4,346,132

CELLULAR AIR BAG INSULATION AND INSULATOR

Chen-Yen Cheng, and Wu-Cheh Cheng, both of 9605 La Playa St., NE., Albuquerque, N. Mex. 87111

Continuation-in-part of Ser. No. 21,020, Mar. 16, 1979, Pat. No. 4,262,045. This application Apr. 14, 1981, Ser. No. 254,070

Int. Cl.³ B32B *3/20;* **E04B** *1/80*

U.S. Cl. 428—76 **2 Claims**

1. An inflatable and deflatable cellular bag insulator that comprises

(a) an inflatable and deflatable outer enclosure that is made of a flexible and non-porous film material, is expansible mainly along a first direction and has a front surface and a rear surface upon inflation, the front surface being adapted to face the area to be insulated while in use,

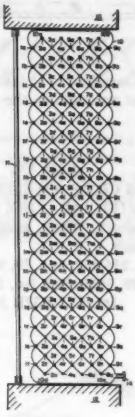
(b) a valving means for inflating and deflating the enclosure,

(c) an inner core that comprises at least one sheet of stacked and mutually bonded flexible film material, each sheet being joined to each neighboring sheet by a set of parallel linear joints laid in the direction substantially parallel to the front surface and substantially perpendicular to the first direction said joints extending substantially the entire length of the sheets forming expansible spaces, and the two sets of linear joints on both sides of an inner sheet being in staggered positions to each other,

(d) linear joints joining the inner core to the outer enclosure,

(e) at least one passage for transferring gas from the valving means to the expansible spaces of the inner core,

that, upon inflating with a gas, the linear joints and the film material in the inner core and the outer enclosure are pulled



away from each other to form an array of layers of parallel compartments extending from a first end to a second end and filled with the inflating gas, reducing heat transfer through the inflated unit by reducing convective flow of gas within the enclosure and requiring heat to pass through the multilayers of the gas filled compartment, wherein the improvement that comprises closing a portion of the parallel compartments at the first end and closing a portion of the parallel compartments at the second end to thereby reduce convective movement of gas contained therein.

4,346,133

STRUCTURAL LAMINATE AND METHOD FOR MAKING SAME

Donald E. Hipchen, Seminole; Michael J. Skowronski, and Joseph R. Hagan, both of Clearwater, all of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Continuation-in-part of Ser. No. 79,771, Sep. 28, 1979, Pat. No. 4,284,683, which is a continuation of Ser. No. 866,110, Mar. 13, 1978, abandoned, which is a continuation of Ser. No. 745,169, Nov. 26, 1976, abandoned, which is a division of Ser. No. 650,243, Jan. 19, 1976, Pat. No. 4,028,158. This application May 22, 1981, Ser. No. 266,562

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.³ B32B *5/20, 5/26, 5/28*

U.S. Cl. 428—109 **21 Claims**

1. A structural laminate comprising:

A. at least one planar facing sheet;

B. a rigid foam attached to one surface of the facing sheet, the rigid foam formed from a foam-forming mixture; and

C. glass fibers wherein:

I. the glass fibers are distributed substantially evenly throughout the rigid foam,

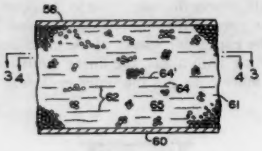
II. the glass fibers are greater than one foot in length,

III. the glass fibers are arranged in layers,

IV. each layer of glass fibers is substantially parallel to the facing sheet, and

V. the rigid foam completely fills the interstices between the glass fibers, the glass fibers being held in fixed rela-

tionship with respect to each other solely by the rigid foam.



6. The structural laminate of claim 1 wherein the glass fibers in each layer are at an angle to the glass fibers in each next adjacent layer.

4,346,134

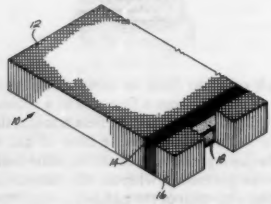
HONEYCOMB CORE ASSEMBLY INCLUDING A SACRIFICIAL CORE PORTION

R. John Hilton, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 164,437, Jun. 30, 1980. This application Sep. 29, 1980, Ser. No. 191,737

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 **2 Claims**



1. A honeycomb core assembly useful in a process for simultaneously machining a plurality of surface portions of said honeycomb core assembly, said honeycomb core assembly comprising:

a honeycomb core blank having a low density portion and a higher density portion;

a sacrificial honeycomb core portion having a density less than said higher density portion of said honeycomb core blank;

temporary fastening means disposed between facing surface portions of said higher density portion of said honeycomb core blank and said sacrificial honeycomb core portion; and

said plurality of surface portions comprising a surface portion of said higher density portion and a surface portion of said sacrificial honeycomb core portion.

4,346,135

FIBROUS REINFORCING MEANS FOR CEMENTITIOUSLY AND BITUMINOUSLY BOUND COMPOSITE STRUCTURES AND COATINGS

Adolf Arnheiter, St. Gallen, and Rudolf Enzler, Lichtensteig, both of Switzerland, assignors to Arnheiter AG, Forta-Seilwerke, St. Gallen, Switzerland

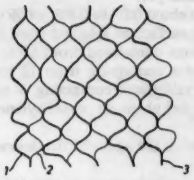
Filed Apr. 14, 1980, Ser. No. 139,727

Claims priority, application Switzerland, May 3, 1979, 4153/79

Int. Cl.³ B32B *5/04*

U.S. Cl. 428—212 **6 Claims**

1. A fibrous reinforcing means for structures and coatings of the type selectively bound together by cement and by bitumen comprising at least two different fiber forms, one of said fiber forms being a closed fiber net including spring elastic fiber means, said closed fiber net having a condensed form prior to being added to a material with which it is mixed and said spring elastic fiber means being means urging said closed fiber net to an open form, said closed fiber net including a first group of fibers and a second group of fibers, said second group of fibers



defining said spring elastic fiber means, the fibers of said first group having a length different from the length of the fibers of said second group, and said fiber forms each comprising fibers of various lengths for distribution in the mixing material in a percentage equivalent in the intended distribution percentage of mixing material aggregates of different grain sizes.

4,346,136

BONDABLE MAGNET WIRE COMPRISING POLYAMIDE-IMIDE COATING CONTAINING RESIDUAL SOLVENT

John H. Lupinski, Scotia, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jul. 14, 1980, Ser. No. 168,481

Int. Cl.³ B05D *5/10;* **B32B** *15/02, 15/08;* **H01B** *3/30*

U.S. Cl. 428—213 **9 Claims**

1. A bondable, non-tacky, enamel coated, insulated, electrical conductor comprising an electrical conductor, a base insulation coating on said conductor of cured, solid, thermosetting, resin enamel, and an overcoat of polyamide-imide enamel on said base coating, characterized in that said polyamide-imide enamel includes residual solvent in an amount such that said polyamide-imide enamel is self-bondable upon heating to a temperature above the ambient temperatures at which said conductor is stored and worked.

4,346,137

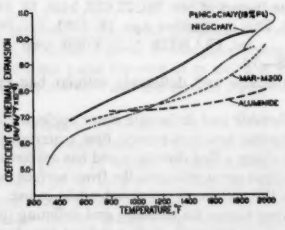
HIGH TEMPERATURE FATIGUE OXIDATION RESISTANT COATING ON SUPERALLOY SUBSTRATE

Ralph J. Hecht, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1979, Ser. No. 105,358

Int. Cl.³ B32B *15/04*

U.S. Cl. 428—215 **6 Claims**



1. A coated article consisting of a superalloy substrate having a protective coating on at least part of the substrate, said coating consisting essentially of 8–30% Cr, 5–20% Al, 10–60% Ni, 8–30% Co, from 0.05–1.0% of a material selected from the

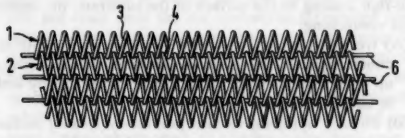
group consisting of Y, Sc, and La, and mixtures thereof, balance Pt, Rh and mixtures thereof in an amount of at least 13%.

4,346,138

SIEVE BELT OF THERMOSETTABLE SYNTHETIC RESIN HELICES FOR PAPERMAKING MACHINE

Johannes Lefferts, Enschede, Netherlands, assignor to SITEG Siebtechnik GmbH, Ahaus-Alstatte, Fed. Rep. of Germany

Filed Jan. 11, 1980, Ser. No. 111,497
Claims priority, application Netherlands, Apr. 23, 1979, 7903176; Fed. Rep. of Germany, Sep. 21, 1979, 2938221
Int. Cl.³ D04H *3/02*
U.S. Cl. 428—222 5 Claims



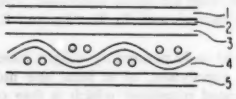
1. A sieve belt of the type used in a paper making machine and comprising a plurality of interleaved helices of windings of thermosettable synthetic resin, the helices being longitudinally unbiased and the windings being free of torsion, and a plurality of pintle-filaments extending through respective channels formed by the interleaved windings of adjacent helices, the individual windings of the helices protruding into the material of the pintle-filaments so that the helices and pintle-filaments are interlocked to hold together the helices and prevent lateral shifting thereof.

4,346,139

HIGHLY WEATHER-PROOF HIGH STRENGTH TRI-AXIAL WOVEN MEMBRANE MATERIALS

Yoshitaka Osawa; Akira Nishimura, and Shinichi Toyooka, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 31, 1980, Ser. No. 221,750
Claims priority, application Japan, Mar. 7, 1980, 55/29514
Int. Cl.³ B32B *7/00, 27/00*
U.S. Cl. 428—252 13 Claims



1. A highly weather-proof high strength membrane material which comprises
- a polyvinyl fluoride resin film coated with an adhesive layer on one side thereof,
- a urethane resin applied by spraying on the adhesive layer,
- a triaxially woven fabric of polyaramide fibers as reinforcing fibers adhered on one surface thereof onto the sprayed urethane layer, and
- a urethane resin applied by spraying on another surface of the fabric.

4,346,140

COMPOSITE STRUCTURE OF AN AROMATIC POLYAMIDE FABRIC COATED WITH A FLUOROSILICONE RUBBER

Richard H. Carlson, Clinton, Conn., and Gerald L. Gatcomb, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1981, Ser. No. 249,225
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—252 7 Claims

1. A composite sheet structure comprising a layer about 2–30 mils thick of a fluorosilicone rubber firmly adhered to both sides of an aromatic polyamide fabric and having a dielectric constant of about 4–8 and a dissipation factor of about 0.015–0.030 where the dielectric constant and dissipation factor are determined at one megahertz frequency according to ASTMD-1531.

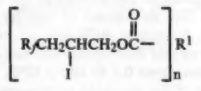
4,346,141

IODINE-SUBSTITUTED POLYFLUOROALKYL ESTERS AND THEIR USE

William R. Remington, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 149,576, May 14, 1980, abandoned. This application Mar. 30, 1981, Ser. No. 249,224
Int. Cl.³ D04H *1/58*
U.S. Cl. 428—289 22 Claims

1. A compound having the formula:



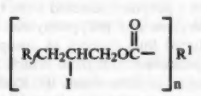
wherein

R_f is a fluorinated aliphatic containing at least 3 carbons;

R^1 is the hydrocarbon residue of either citric, succinic, chlorendic, trimellitic or pyromellitic acid; and

n is a number from 1 to 4.

7. A process for imparting oil- or water-repellency, or dry soil resistance to a substrate which comprises applying to the substrate at least one compound having the formula:



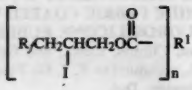
wherein

R_f is a fluorinated aliphatic containing at least 3 carbons;

R^1 is the hydrocarbon residue of either citric, phthalic (o, m or p isomer), benzoic, succinic, chlorendic, trimellitic or pyromellitic acid; and

n is a number from 1 to 4.

15. A substrate exhibiting oil- or water-repellency or dry soil resistance and having deposited thereon a compound having the formula:



wherein

R_f is a fluorinated aliphatic containing at least 3 carbons;

R^1 is the hydrocarbon residue of either citric, phthalic (o, m or p isomer), benzoic, succinic, chlorendic, trimellitic or pyromellitic acid; and

n is a number from 1 to 4.

4,346,142

HYDROPHILIC MONOMER TREATED MICROPOROUS FILMS AND PROCESS

Nelson R. Lazear, New Martinsville, W. Va., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 71,644, Sep. 4, 1979, abandoned. This application Nov. 14, 1980, Ser. No. 206,975

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—315.7 **15 Claims**

1. A process for preparing an open celled hydrophilic polyolefinic microporous film having an electrical resistance of less than about 30 milliohms per square inch and a water flow rate therethrough of greater than about 0.01 cc/min/cm² at a pressure differential of about one atmosphere from a normally hydrophobic polyolefinic microporous film selected from the group consisting of polyethylene and polypropylene microporous films, comprising the steps of:

(a) coating the surface of the micropores of a normally hydrophobic polyethylene or polypropylene open celled microporous film characterized by having a reduced bulk density as compared to the bulk density of a precursor film from which it is prepared, an average pore size of from about 200 to about 10,000 Angstroms, and a surface area of at least about 10 square meters per gram, with at least one hydrophilic organic hydrocarbon monomer having from about 2 to about 18 carbon atoms characterized by the presence of at least one double bond and at least one polar functional group; and

(b) chemically fixing to the surface of the micropores of the microporous film an amount of said hydrophilic organic hydrocarbon monomer sufficient to preserve the open celled nature of said micropores and sufficient to obtain an add-on of from about 0.1 to about 10%, by weight, based on the weight of the uncoated microporous film, by irradiating the coated microporous film of (a) with an amount of ionizing radiation of from about 1 to 10 megarads for polyethylene microporous films and from about 3 to 10 megarads for polypropylene films.

8. A hydrophilic open celled microporous film having an electrical resistance of less than about 30 milliohms per square inch and a water flow rate therethrough of greater than about 0.01 cc/min/cm² at a pressure differential of about one atmosphere comprising:

(a) an open celled normally hydrophobic microporous film prepared from a polymer selected from the group consisting of polyethylene and polypropylene characterized by having a reduced bulk density as compared to the bulk density of a precursor film from which it is prepared, an average pore size of from about 200 to about 10,000 Angstroms and a surface area of at least 10 square meters per gram; and

(b) a coating on the surface of the micropores of the microporous film of at least one hydrophilic organic hydrocarbon monomer having from about 2 to about 18 carbon atoms characterized by the presence of at least one double bond and at least one polar function group in an amount sufficient to preserve the open celled nature of the microporous film and to obtain an add-on of from about 0.1 to about 10%, by weight, based on the weight of the uncoated microporous film, said hydrophilic organic hydrocarbon monomer coating being chemically fixed to the surface of the micropores of the microporous film by exposure to an amount of ionizing radiation of from about 1 to 10 megarads for polyethylene microporous films and from about 3 to 10 megarads for polypropylene microporous films.

4,346,143

METHOD OF APPLYING ZINC-RICH PRIMER AND PRODUCT

Charles L. Young, Jr., Westerville, Ohio, and Ralph C. Gray, Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 7, 1977, Ser. No. 849,292

Int. Cl.³ B32B *15/04, 15/08*

U.S. Cl. 428—332 **20 Claims**

1. An improved method of providing corrosion resistance to a ferrous metal substrate which involves the application of a zinc-rich coating to the surface of the substrate, the improvement comprising:

(A) treating the surface of the ferrous metal substrate by contacting the ferrous metal substrate for at least one and up to 60 seconds with 1 to less than 20 percent by weight of aqueous nitric acid followed by

(B) directly applying to said previously treated surface a zinc-rich coating which contains at least 30 percent by volume pulverulent zinc in a resinous binder.

16. A ferrous metal article coated by the method of claim **1**.

4,346,144

POWDER COATING COMPOSITION FOR AUTOMOTIVE TOPCOAT

James M. Craven, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 21, 1980, Ser. No. 170,868

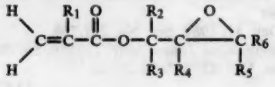
Int. Cl.³ C08L *63/08, 61/28, 63/10*

U.S. Cl. 428—335 **17 Claims**

1. A thermosetting powder coating composition of finely divided particles having a particle size of about 1 to 100 microns, wherein the particles are an intimately mixed blend consisting essentially of:

A. an acrylic copolymer consisting essentially of polymerized monomers of:

(1) about 8 to 35 percent by weight, based on the weight of the copolymer, of a monoethylenically unsaturated monomer having the formula

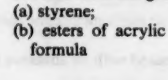


where R_1 and R_4 are the same or different and are each selected from the group consisting of hydrogen and the methyl radical, and R_2, R_3, R_5, and R_6, are hydrogen and

(2) about 65 to 92 percent by weight, based on the weight of the copolymer, of at least one monoethylenically unsaturated monomer which is free of epoxy groups selected from the group consisting of

(a) styrene;

(b) esters of acrylic or methacrylic acid having the formula



where R^1 is selected from the group consisting of

hydrogen and the methyl radical, and R^7 is selected from the group consisting of C_1–C_{20} aliphatic hydrocarbon radicals and C_1–C_{20} aromatic hydrocarbon radicals.

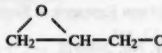
wherein the copolymer has a number average molecular weight of about 1,500 to 10,000, a weight average molecular weight of about 3,000 to 18,000, and a glass transition temperature of about 30° C. to 100° C;

B. a carboxy-terminated crosslinking agent consisting of an aliphatic dicarboxylic acid having the formula

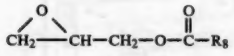
$$HOOC-(CH_2)_n-COOH$$

where n is an integer from 8–18; said crosslinking agent being present in an amount sufficient to provide 0.9–1.5 carboxylic acid groups for each epoxy group orginially in the copolymer;

C. a supplementary crosslinking having at least one functional group which is capable of reacting with either hydroxyl groups or carboxylic acid groups, and which will not react until the the carboxylic-terminated crosslinking agent has reacted with the acrylic copolymer said supplementary crosslinking being present in an amount sufficient to provide 0.1–0.7 functional group for each epoxy group originally in the acrylic copolymer and is selected from the group consisting of an alkylated melamine formaldehyde resin, an alkylated glycoluril resin, an aliphatic glycidyl ether having the formula

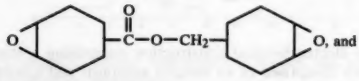


an aliphatic glycidyl ester having the formula

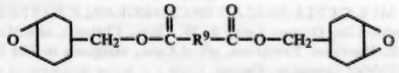


where R^8 is selected from the group consisting of the C_1–C_{20} aliphatic hydrocarbon radicals,

a cycloaliphatic epoxide having the formula



a cycloaliphatic epoxide having the formula



where R^9 is selected from the group consisting of bivalent C_6–C_{10} aromatic hydrocarbon radicals and bivalent C_2–C_{20} aliphatic hydrocarbon radicals; and

D. at least one agent capable of preventing the degradation of the coating by ultraviolet light

wherein the agent has a weight average molecular weight of greater than 300 and a particle size of less than 40 microns.

4,346,145

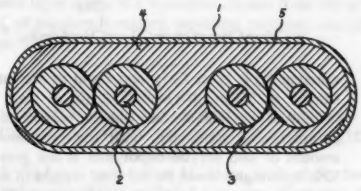
COATING COMPOSITION AND COATED ARTICLES

Jae H. Choi, Warren Township, Marion County, Ind.; John J. Mottine, Jr., Red Bank Township, Monmouth County, N.J.; Walter J. Sparzak, Sr., Catonsville, and William C. Vesperman, Bel Air, both of Md., assignors to Western Electric Co., Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 5, 1981, Ser. No. 222,440

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—389 **11 Claims**



1. A strand material having a char-forming flame retardant covering thereover, said covering comprising a polyvinyl chloride resin, a plasticizer consisting essentially of 45–60 parts by weight per 100 parts of resin of a flame retardant phosphate plasticizer, said plasticizer comprising 30–60% by weight of tributoxyethyl phosphate, or 85–100% by weight 2-ethylhexyl diphenyl phosphate, 4–8 parts by weight of a cycloaliphatic epoxy resin, and 2–4 parts by weight of a metallic stabilizer.

4,346,146

POROUS FLAME RETARDANT ACRYLIC SYNTHETIC FIBERS AND A METHOD FOR PRODUCING THESE FIBERS

Yoshikazu Kondo; Toshihiro Yamamoto, and Takaji Yamamoto, all of Hofu, Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Synthetic Fibers, Ltd., Osaka, both of, Japan

Filed Jun. 6, 1980, Ser. No. 156,994

Claims priority, application Japan, Jun. 18, 1979, 54-77048; Jun. 18, 1979, 54-77049

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—398 **10 Claims**

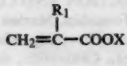
1. A porous, flame-retardant, acrylic, synthetic fiber, in which the polymeric component of said fiber consists of a mixture of

(A) from 2 to 50% by weight of cellulose acetate, and

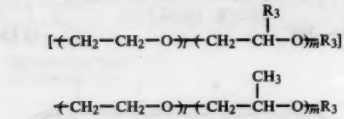
(B) from 50 to 98% by weight of a polymer material selected from the group consisting of

1. modacrylic copolymer consisting of from (i) 20 to 60% by weight of at least one of vinyl chloride and vinylidene chloride, (ii) less than 5% by weight of a copolymerizable monomer different from vinyl chloride, vinylidene chloride and acrylonitrile, and (iii) the balance is acrylonitrile, and

2. mixture of said modacrylic copolymer and an acrylic copolymer consisting of (i) from 5 to 30% by weight of monomer having the formula



wherein R_1 is H or CH_3, X is selected from the group consisting of H, NH_4, alkali metal and



wherein R_3 is H or CH_3, and l and m are integers of from 0 to 50 and $0<l+m\leqq 50$, (ii) at least 70% by weight of acrylonitrile and (iii) the balance is said copolymerizable monomer, with the proviso that the amount of said acrylic copolymer is not greater than 33% by weight, based on the total weight of said polymeric component of said fiber, said fiber having a surface area A of voids of not greater than 15 m^2/g, a porosity V of from 0.05 to 0.75 cm^3/g and the ratio of porosity V/surface area A being 1/30 or more, said fiber having mainly macrovoids formed by phase separation of said cellulose acetate and said modacrylic copolymer.

4,346,147

METHOD OF MANUFACTURING NITRIDED SILICON PARTS

Pernette Barlier, Paris, and Jean-Paul Torre, Mennecy, both of France, assignors to Association pour la Recherche et Developpement des Methodes et Processus Industriels (ARMINES), Paris, France

Filed Jan. 4, 1980, Ser. No. 109,713
Claims priority, application France, Jan. 5, 1979, 79 00268
Int. Cl.³ F27B *9/04*
U.S. Cl. 428—446 **6 Claims**

1. A material which is oxidation resistant when hot, said material being formed by a solid solution of aluminum and oxygen in silicon nitride, of the β'-SiAlON type and being formed by nitriding sintering of silicon powder in an atmosphere rich in nitrogen, the improvement comprising adding about 1 to 10% by weight of aluminum to the silicon powder before sintering thereof and subjecting the silicon nitride sintered with aluminum to preliminary oxidation while hot under conditions such that the aluminum and oxygen supplied by ambient atmosphere react on the silica formed at the surface to form a surface layer of acicular mullite.

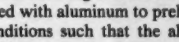
4,346,148

PHOSPHORUS-CONTAINING COMPOSITIONS, LUBRICANTS CONTAINING THEM AND METAL WORKPIECES COATED WITH SAME

Richard W. Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 36,113, May 4, 1979, abandoned. This application Sep. 21, 1979, Ser. No. 77,879
Int. Cl.³ B32B *15/08, 27/00*
U.S. Cl. 428—461 **27 Claims**

1. A metal working lubricant comprising a major amount of lubricating oil and a minor amount, effective to improve the rust inhibiting and extreme pressure properties thereof, of a phosphorus-containing composition comprising at least one compound having the formula



wherein:

Each R^1 is independently an aliphatic hydrocarbon-based radical having from about 4 to about 100 carbon atoms;
each R^2 is independently an ethylene, trimethylene, lower alkyl-substituted ethylene or lower alkyl-substituted trimethylene radical; and
each Ar^1 is independently an aromatic radical.

24. A metal workpiece having on its surface a film of a lubricant according to claim 1, 5, 6, 7, 11, 12 or 16.

4,346,149

WATER BASED ALUMINUM PAINT

James E. Sullivan, Fort Myers, Fla., assignor to Gulfko Incorporated, Fort Myers, Fla.

Filed May 19, 1980, Ser. No. 151,345
Int. Cl.³ C08K *3/08*
U.S. Cl. 428—516 **9 Claims**

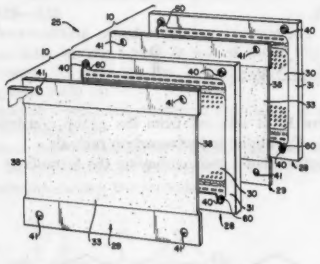
1. A process for coating a plastic film with a water based aluminum paint which comprises preparing a paint by adding sequentially while stirring to water containing a small amount of a dispersant, aluminum paste or powder, finely divided mica, an acrylic polymer and an antifoamer in suitable amounts to form a paint, and coating the surface of a plastic film with said paint, said coating having high reflectivity toward heat and light, and being water resistant and crack resistant.

4,346,150

ELECTROCHEMICAL CONSTRUCTION

Richard J. Bellows; Patrick G. Grimes, both of Westfield; Kenneth R. Newby, Berkeley Heights; Harry Einstein, Springfield, and Hsue C. Tsien, Chatham Township, Morris County, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 1, 1981, Ser. No. 268,675
Int. Cl.³ H01M *4/00, 8/00*
U.S. Cl. 429—18 **12 Claims**



1. An electrochemical construction comprising a stack of cells each comprised of an integral separator and spacer disposed between adjacent electrodes each comprised of a plastic sheet having a coextruded electrically conductive mid-portion and electrically non-conductive side portions.

4,346,151

MULTICELL SEALED RECHARGEABLE BATTERY

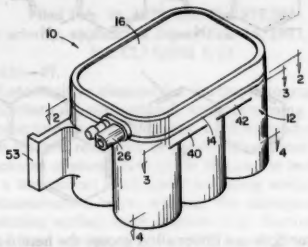
Toshio Uba, Denver; Larry K. W. Ching, Littleton, and Michael R. Harrison, Evergreen, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Dec. 29, 1980, Ser. No. 221,227
Int. Cl.³ H01M *10/12*
U.S. Cl. 429—54 **12 Claims**

1. A multicell sealed rechargeable battery and housing therefor capable of withstanding variable internal pressures, comprising:
an open mouth substantially rigid monobloc container including a plurality of cup-shaped cell holders of internal substantially cylindrical shape each interconnected to at

least one adjacent cell holder at mutual circumferential tangent zone(s), to define common substantially non-deformable intercell partitions at such zones;

non-self-contained electrochemical cells having plates and



separator spirally wound together in substantially cylindrical shape closely fitting in said cell holders and electrically interconnected to form a battery; and

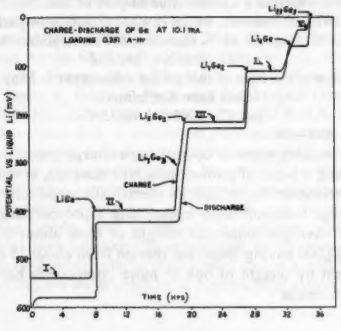
a closure member attached to the monobloc container at its mouth.

4,346,152

LITHIUM-GERMANIUM ELECTRODES FOR BATTERIES

Anthony F. Sammells, Naperville, and Michael R. St. John, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jul. 18, 1980, Ser. No. 169,962
Int. Cl.³ H01M *4/40*
U.S. Cl. 429—112 **17 Claims**



1. A negative lithium electrode for molten salt electrical storage batteries comprising:

an electrochemically active material selected from the group consisting of lithium-germanium alloys, lithium-germanium-silicon alloys, lithium-germanium-aluminum alloys and mixtures thereof, and

a current collector support in electronic communication therewith.

4,346,153

ELECTRODE FOR A LEAD-ACID STORAGE CELL

Michel Rigal, Lille, and Jean Sterens, Haubourdin, both of France, assignors to Compagnie Europeenne d'Accumulateurs, Paris, France

Filed Jan. 6, 1981, Ser. No. 222,761
Claims priority, application France, Jan. 18, 1980, 80 01065
Int. Cl.³ H01M *4/68, 4/70*
U.S. Cl. 429—234 **13 Claims**

1. An electrode for a lead-acid storage cell, said electrode containing an active material, an active material support made of lead or a lead alloy, and at least one electric conductor which includes an elongated core made of a substance chosen from the group consisting of copper, aluminum, silver, zinc,

and alloys of each of these metals, said core being coated with a protective layer made of a substance chosen from the group consisting of titanium, tungsten, tantalum, niobium, zirconium and alloys thereof.

4,346,154

ANTISTAIN AGENT OR ANTISTAIN AGENT PRECURSOR IN PHOTOGRAPHIC SILVER HALIDE ELEMENT

Donald F. McLaen, and Arthur H. Herz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,330
Int. Cl.³ G03C *1/06, 1/48*
U.S. Cl. 430—14 **15 Claims**

1. In a photographic silver halide element comprising a support having thereon

(a) a photographic silver halide gelatino emulsion layer,

(b) an undercoat layer between the emulsion layer and the support,

the improvement comprising

in the undercoat layer a stain retarding concentration of a phosphine antistain agent or phosphine antistain agent precursor.

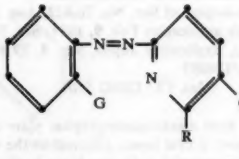
4,346,155

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE 6-ARYLAZO-3-PYRIDINOL MAGENTA DYE-RELEASING COMPOUNDS AND PERCURSORS THEREOF

Derek D. Chapman, and James A. Reczek, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 237,170, Feb. 23, 1981, which is a division of Ser. No. 174,406, Aug. 1, 1980, Pat. No. 4,287,292. This application Aug. 24, 1981, Ser. No. 295,455
Int. Cl.³ G03C *1/40, 7/00, 1/10, 5/54*
U.S. Cl. 430—17 **3 Claims**

1. A photographic element comprising a support having thereon a layer comprising a photographic mordant having bound thereto a coordination complex of a polyvalent metal ion and a compound having the formula:



wherein:

R represents hydroxy or amino; and

G represents carboxy; a hydrolyzable ester group having the formula $COOR^2$, wherein R^2 is an alkyl or substituted alkyl group having 1 to about 8 carbon atoms or an aryl or substituted aryl group having 6 to about 10 carbon atoms; or a sulfamoyl group having the formula SO_2NHR^3 wherein R^3 represents hydrogen, alkyl or substituted alkyl having 1 to about 8 carbon atoms, aryl or substituted aryl

having 6 to about 10 carbon atoms, or an acyl group having 1 to about 8 carbon atoms.

4,346,156

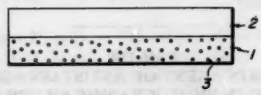
ELECTROPHOTOGRAPHIC-MAGNETIC DUPLEX IMAGING STRUCTURE AND METHOD

Eugene C. Faucz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 672,809, Apr. 1, 1976, abandoned. This application Sep. 27, 1976, Ser. No. 726,853

Int. Cl.³ G03G *19/00*

U.S. Cl. 130—39 **9 Claims**



1. A thermomagnetic recording method comprising

charging electrostatically the surface of a photoconductive layer of a recording member including the photoconductive layer and a magnetizable layer,

said photoconductive layer being transmissive of electromagnetic radiation of at least some wavelength within the visible spectrum extending from about 2900 to about 38,000 angstroms and being photoelectrically responsive to actinic radiation of some wavelength within the visible spectrum,

said magnetizable layer being absorbtive of the radiation transmitted through the photoconductive layer,

exposing the charged surface of the recording member to a pattern of actinic radiation to create a corresponding pattern with electrostatic charge on the surface,

developing the electrostatic charge pattern by depositing a toner material on the photoconductive surface that either reflects or absorbs radiation transmitted by the photoconductive layer,

recording the magnetizable layer with a uniform pattern of magnetic transitions, and

exposing, from the photoconductive layer side, the recording member to radiation transmitted by the photoconductive layer to heat the magnetizable layer above its Curie point temperature in regions complementary to the toner material to record a latent magnetic image in the magnetizable layer corresponding to the pattern of the toner material.

4,346,157

COMPLEX TYPE ELECTROPHOTOGRAPHIC PLATE

Atsushi Kakuta, Hitachiota; Shigeo Suzuki, Hitachi; Yasuki Mori, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

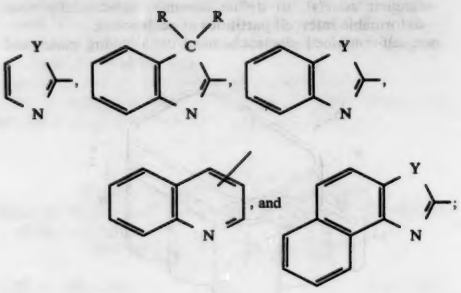
Continuation-in-part of Ser. No. 70,822, Aug. 29, 1979, abandoned. This application Feb. 9, 1981, Ser. No. 232,829

Claims priority, application Japan, Sep. 4, 1978, 53/107466; Nov. 8, 1978, 53/136697

Int. Cl.³ G03G *5/09*

U.S. Cl. 430—58 **18 Claims**

1. A complex type electrophotographic plate comprising a conductive support; a first layer, adhered to the support, of a charge generating material, said first layer having a thickness of 0.1 to 5 μm; and a second layer, superposed on the first layer, of a homogeneous mixture of a charge transport material, and an insulating, resinous binder therefor, said second layer having a thickness of 5 to 100 μm and being substantially transparent to light of a wavelength of 4200 to 8000 Å; wherein said charge transport material is at least one member selected from the class consisting of nonionic compounds represented by the general formula: X—(CH=CH)$_n$Ar where X is a heterocyclic group selected from the group consisting of



and Y is O or S; R is a lower alkyl group; the hetero ring may be substituted; n is an integer of 0, 1 or 2; and Ar is an aryl or substituted aryl group.

4,346,158

IMAGING SYSTEM WITH A DIAMINE CHARGE TRANSPORT MATERIAL IN A POLYCARBONATE RESIN

Damodar M. Pai; Milan Stolka, and John F. Yanus, all of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

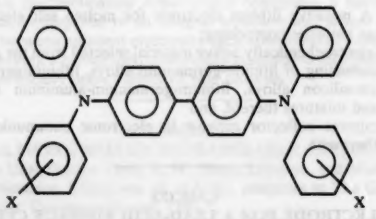
Continuation-in-part of Ser. No. 965,969, Dec. 4, 1978, Pat. No. 4,265,990, which is a continuation-in-part of Se . No. 793,819, May 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 716,403, Aug. 23, 1976, abandoned. This application May 4, 1981, Ser. No. 260,496

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.³ G03G *5/00, 5/04*

U.S. Cl. 430—59 **6 Claims**

1. An imaging member comprising a charge generation layer comprising a layer of photoconductive material, a contiguous charge transport layer, and an electrically conductive layer, said charge transport layer comprising a polycarbonate resin material having a molecular weight of from about 20,000 to about 120,000 having dispersed therein from about 25 to about 75 percent by weight of one or more compounds having the general formula:



wherein X is selected from the group consisting of an alkyl group, having from 1 to about 4 carbon atoms and chlorine, said photoconductive layer exhibiting the capacity of photogeneration of holes and injection of said holes and said charge transport layer being capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said charge transport layer to said electrically conductive layer.

4,346,159

PHOTOSENSITIVE ELEMENT FOR ELECTROPHOTOGRAPHY

Shigeru Sadamatsu; Lyon S. Pu, and Yoshihisa Ishikawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,783
Claims priority, application Japan, Feb. 14, 1977, 52-14152
Int. Cl.³ G03G 5/14
U.S. Cl. 430—67 **12 Claims**

1. A photosensitive element for electrophotography having improved charging performance and comprising an electrically conductive backing member, a photoconductive layer having an electric resistance of greater than about 10^{13} Ω·cm and a thickness of about 10 to about 50μ on the backing member, and a transparent electrically insulating surface layer on the photoconductive layer, wherein the transparent electrically insulating surface layer contains a an electron donating compound in an amount of 0.01 to 30% by weight or a layer of an electron donating compound about 0.01 to about 15μ thick interposed between the photoconductive layer and the transparent electrically insulating surface layer, whereby a charge-retentive layer is formed in the boundary between the photoconductive layer and the transparent electrically insulating layer to prevent a charge held in the boundary between the photoconductive layer and the transparent electrically insulating layer from discharging, wherein a positive-type photoconductor is used as the photoconductive layer, further wherein said transparent electrically insulating layer is a layer of a member selected from the group consisting of a polysiloxane, a polyurethane, a polyester, a polyethyleneoxide, a polyethylene terephthalate, a polyethylene, a polyoxyethylene, a polycarbonate, a polystyrene, a polyphenylether, a polyphenylene, a polypeptide, an acrylonitrile/butadiene/styrene resin, an acrylonitrile/styrene resin, an apoxy resin, a polyvinyl alcohol, a polyacetal, a polyamide, a urea resin, a melamine resin, an acrylic resin or a copolymer thereof and wherein said electron donating compound is selected from the group consisting of Nigrothin, Methylene Blue, Indigo Blue, Congo Red, Victoria Pure Blue, Violet 6B, Fuchsin, Basic Cyanine LG, Auramine, Naphthalene Green, Acid Rhodamine G, Fluorescin, Rose Bengal, Eosin A, Eosin Y, Pholoxine Pinakryptol Green, Celestine Blue, Quinoline Blue, cyanine dyes, Oil Red B, Chrome Blue, Blue Black RG, a condensed polycyclic compound, an amine compound, a quaternary amine compound, an aniline derivative, a nitrogen-containing heterocyclic compound, a sulfur-containing heterocyclic compound, an oxygen-containing heterocyclic compound, a nitrogen- and oxygen-atom containing heterocyclic compound, a nitrogen- and sulfur-atom containing heterocyclic compound, an oxygen- and sulfur-atom containing heterocyclic compound or a sulfur-, nitrogen- and oxygen-atom containing heterocyclic compound.

4,346,160

TWO-SHEET DIFFUSION TRANSFER ELEMENTS

John F. Bishop, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 174,421, Aug. 1, 1980, Pat. No. 4,298,682.
This application Mar. 16, 1981, Ser. No. 243,678
Int. Cl.³ G03C 1/76
U.S. Cl. 430—215 **20 Claims**

1. In a photographic assemblage comprising:

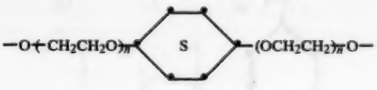
(A) a photographic element comprising a support having thereon at least one exposed photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, and superposed thereon in face-to-face contact therewith:

(B) a dye image-receiving element comprising a support having thereon a dye image-receiving layer, said receiving element being adapted to be separated from said photographic element after processing thereof;

the improvement wherein either said photographic element or said receiving element has thereon an overcoat layer, said overcoat layer being located at the interface of said photographic element and said receiving element superposed thereon, said overcoat layer comprising either silica in a hydrophilic colloid at a ratio of 2:1 to 7:1, or an ionic polyester in a hydrophilic colloid at a ratio of 1:5 to 10:1, said polyester comprising recurring units of:

(I) a diol component which comprises:

(a) at least 50 mole percent of units derived from diols having the structures:



wherein n is an integer of from 1 to 4; and

(ii) O—(RO)—$_m$, wherein m is an integer of from 2 to 4, and R is an alkylene group of 2 to about 4 carbon atoms; and

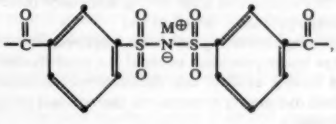
(b) 0 to 50 mole percent of units derived from one or more diols having the structure:

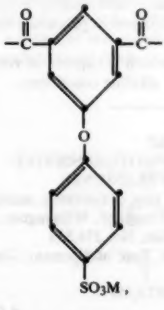
—O—R^1—O—

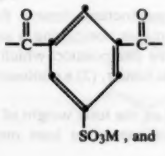
wherein R^1 is an alkylene group of up to about 16 carbon atoms, a cycloalkylene group of 6 to about 20 carbon atoms, a cycloalkylenebisalkylene group of 8 to about 20 carbon atoms, an arylenebisalkylene group of 8 to about 20 carbon atoms, or an arylene group of 6 to about 12 carbon atoms; and

(II) an acid component which comprises:

(a) 8 to 30 mole percent of units derived from one or more ionic dicarboxylic acids, said units having the structures:







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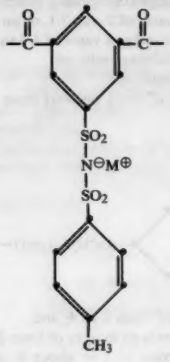


wherein M is ammonium or a monovalent metal; and

(b) 70 to 92 mole percent of recurring units derived from other diacids.

4,346,161

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE 6-(2-THIENYLAZO)-3-PYRIDINOL CYAN DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF

James J. Krutak; Robert J. Maleski, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1981, Ser. No. 258,845

Int. Cl.³ G03C *7/00, 1/40, 1/10, 5/54*

U.S. Cl. 430—223 **41 Claims**

22. In a photographic assemblage comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material: and

(b) a dye image-receiving layer: the improvement wherein said dye image-providing material is a nondiffusible compound having at least one diffusible 6-(2-thienylazo)-3-pyridinol dye moiety or precursor thereof, said compound containing:

(a) in the 3-position of the thienylazo moiety a carboxy group, a salt thereof or a hydrolyzable precursor thereof; and

(b) a ballasted carrier moiety which is capable of releasing said diffusible azo dye under alkaline conditions.

4,346,162

NEGATIVE TONABLE PHOTOSENSITIVE REPRODUCTION ELEMENTS

Werner Abele, Neu-Isenburg, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 17, 1981, Ser. No. 274,559

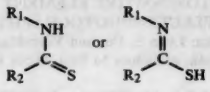
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023247

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **4 Claims**

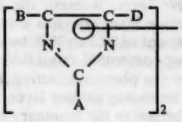
1. Photosensitive nonsilver reproduction element for the preparation of negative tonable images comprising a support bearing a layer of a photosensitive composition which comprises at least (1) one thermoplastic binder, (2) a photosensitive system consisting essentially of

(a) 10 to 50% by weight, based on the total weight of solids in the photosensitive composition, of at least one thio compound of the formula:



wherein R_1 can be H, alkyl of 1 to 4 carbon atoms and aryl of 6 to 10 carbon atoms, and R_2 can be H and alkyl of 1 to 6 carbon atoms, and R_1 and R_2 when taken together can be members of a 5 to 7 membered ring which may contain oxygen, sulfur and nitrogen as additional heteroatoms, and

(b) at least one hexarylbisimidazole compound of the formula:



wherein A, B and D are either identical or different and are optionally substituted aryl groups derived from carbocyclic or heterocyclic compounds; and optionally (3) a plasticizer.

4,346,163

RESIST FOR USE IN FORMING A POSITIVE PATTERN WITH A RADIATION AND PROCESS FOR FORMING A POSITIVE PATTERN WITH RADIATION

Kenichi Takeyama, Osaka; Takayoshi Morimoto, Ashiya, and Kunio Hibino, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 960,770, Nov. 15, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 188,773

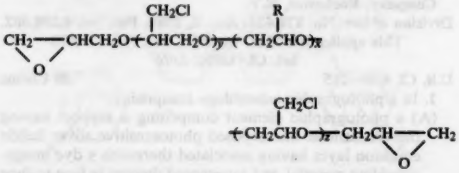
Claims priority, application Japan, Nov. 17, 1977, 52-138574

Int. Cl.³ B05D *3/06*

U.S. Cl. 430—280 **2 Claims**

1. A process for forming a positive pattern with a radiation comprising the steps of:

(1) applying on a substrate a resist comprising a copolymer composed of 100 moles of methyl methacrylate and 1 to 15 moles of methacrylic acid and a cross-linking agent having the following general formula:



wherein R is H or CH_3, x is an integer of 1 to 9, and y and z are zero, or an integer of 1, 2 or 3,

(2) cross-linking the copolymer with the cross-linking agent by heating,

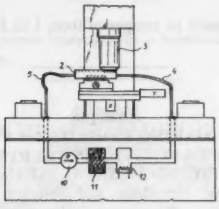
(3) irradiating the desired area with a radiation and then

(4) developing the latent image formed in the resist with the radiation with an organic solvent.

4,346,164
PHOTOLITHOGRAPHIC METHOD FOR THE MANUFACTURE OF INTEGRATED CIRCUITS

Werner Tabarelli, Schlossstr. 5, Vaduz, Liechtenstein (FL-9490), and Ernst W. Löbach, Tonagass 374, Eschen, Liechtenstein (FL-9492)

Filed Oct. 6, 1980, Ser. No. 194,422
Int. Cl.³ G03C 5/00
U.S. Cl. 430—311 5 Claims



1. A photolithographic method of printing a pattern onto a semiconductor substrate, particularly for the manufacture of an integrated circuit, comprising the steps of:

coating said substrate with a photosensitive layer;

juxtaposing a projection lens with said layer across a space separating said lens from said layer;

imaging a pattern of a mask through said lens onto said photosensitive layer to expose said layer; and

filling said space between said layer and a juxtaposed boundary face of said lens with a transparent liquid during the exposure of said layer, the refractive index of said liquid being selected so as to be close to the refractive index of said layer, said liquid being capable of wetting said layer and subsequently incapable of attacking same.

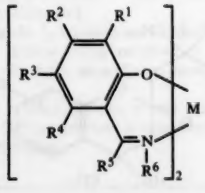
4,346,165
PROCESS FOR IMPROVING LIGHT FASTNESS OF COLOR IMAGES

Satoru Sawada; Shigeru Oono; Nobuo Seto; Yoshiaki Suzuki; Kotaro Nakamura, and Nobuo Furutachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 19, 1981, Ser. No. 223,665
Claims priority, application Japan, Jan. 9, 1980, 55-1635
Int. Cl.³ G03C 7/00
U.S. Cl. 430—372 54 Claims

1. A process for improving the light fastness of a magenta color image comprising incorporating at least one member of the complexes represented by the following formulae (I), (II), (III) and (IV), and at least one member of the discoloration prevention aids represented by the following formulae (V), (VII) and (VIII) in a layer in which said magenta color image can be formed by reaction of a 3-anilino-5-pyrazolone type magenta coupler and an oxidation product of an aromatic primary amine developing agent; wherein formulae (I), (II), (III), and (IV) are

(I)



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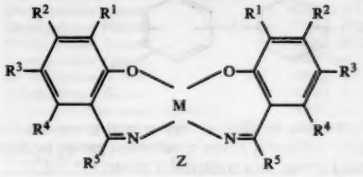
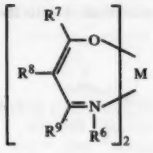
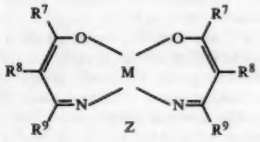
(II)



(III)



(IV)



wherein

M is Cu, Co, Ni, Pd or Pt;

R^1, R^2, R^3, and R^4 are each hydrogen, a halogen atom, a cyano group, an alkyl group linked to the carbon atom of the benzene nucleus either directly or through a divalent linking group, an aryl group, a cycloalkyl group, or a heterocyclic group, or R^1 and R^2, R^2 and R^3, or R^3 and R^4 represent a group of non-metallic atoms combining with each other to form a 6-membered ring;

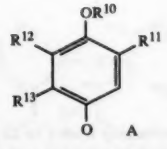
R^5, R^8, and R^9 can each represent hydrogen, an alkyl group, or an aryl group, or R^8 or R^9 together represent a group of non-metallic atoms combining to form a 5- to 8-membered ring;

R^6 is hydrogen, an alkyl group, an aryl group, or a hydroxy group;

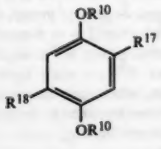
R^7 can represent an alkyl group or an aryl group, or R^7 and R^8 together represent a group of non-metallic atoms combining to form a 5- to 8-membered ring; and

Z is a group of non-metallic atoms forming a 5- or 6-membered ring; and wherein formula (V), (VII) and (VIII) are

(V)



(VII)



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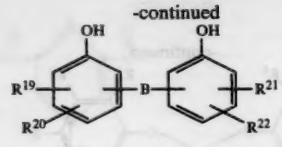


(VIII)

wherein

R^{10} is hydrogen, an alkyl group, an acyl group a sulfonyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, or a trialkylsilyl group;

A is a group of non-metallic atoms completing a 5- or 6-membered ring in combination with the group

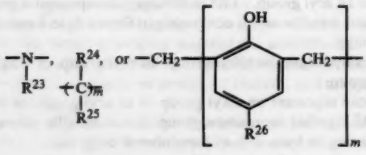
and may contain a bisspiro bond;

R^{11}, R^{12}, and R^{13} are each hydrogen, an alkyl group, an alkoxy group, an aryl group, an aryloxy group, an aralkyl group, an aralkoxy group, an alkenyl group, an alkenoxy group, an acylamino group, a halogen atom, an alkylthio group, an arylthio group, a diacylamino group, an alkoxycarbonyl group, an acyloxy group, an acyl group or a sulfonamido group;

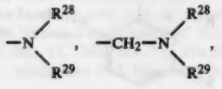
R^{17} is hydrogen, a straight chain or branched chain alkyl group containing from 1 to 22 carbon atoms, or an alkenyl group containing from 3 to 22 carbon atoms;

R^{18} is a straight chain or branched chain alkyl group containing from 1 to 22 carbon atoms or an alkenyl group containing from 3 to 22 carbon atoms;

B is —S—, —S—S—, —O—, —CH_2—S—CH_2—, SO_2—, —SO—, —CH_2—O—CH_2—,



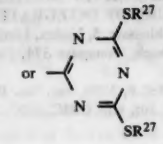
R^{19}, R^{20}, R^{21}, and R^{22} are each hydrogen, an alkyl group, an aryl group, an aralkyl group, an alkylthio group, a halogen atom, an alkoxy group, an arylthio group, an aralkoxy group, an aryloxy group, —$COOR^{27}$, —$NHCOR^{27}$, —$NHSO_2R^{27}$, —O—COR^{27},



or —$CH_2)_nD$, all containing from 1 to 22 carbon atoms;

R^{23} is hydrogen, an alkyl group or an aryl group; R^{24} and R^{25} are each hydrogen, or an aryl group, or they combine together to form a substituted 5- or 6-membered ring; R^{26} is hydrogen or a methyl group; R^{27} is an alkyl group or an aryl group; R^{28} and R^{29} are each hydrogen, an alkyl group, an aryl group, a heterocyclic group or an aralkyl group, or they combine together to form a substituted 5- or 6-membered heterocyclic ring;

D is an ester group or



and

m and n are each an integer of from 1 to 3.

4,346,166

METHOD OF MAKING FAMILIES OF STEADY-STATE HEAT TRANSFER COEFFICIENT CURVES VISIBLE BY PHOTOCHEMICAL MEANS

Bernhard Montag, Forchheim, and Heinrich Optiz, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,235

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008265

Int. Cl.³ G03C *5/30*

U.S. Cl. 430—435 **3 Claims**

1. In a method for making families of steady-state heat transfer coefficient curves visible by photochemical means, wherein, a moist silver halide-containing photogelatin layer is applied to a surface and subjected to a gas stream, whereby an invisible residual moisture profile is obtained in said photogelatin layer, the improvement comprising converting said residual moisture profile into a silver sulfide line photogram by immersing said photogelatin layer, in daylight, in a developer solution mixture comprising alcohol and an organic sulfur compound soluble in alcohol and capable of reacting with the silver halide to form a silver sulfide, and thereafter fixing the line photogram.

4,346,167

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC EMULSION

Eiji Imatomi; Tsuyoshi Ogawa, and Tsutomu Hamaoka, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

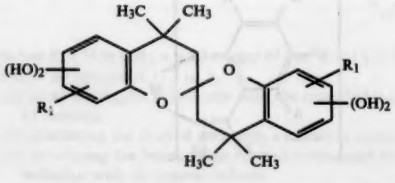
Filed Jul. 29, 1981, Ser. No. 287,850

Claims priority, application Japan, Jul. 29, 1980, 55-104207

Int. Cl.³ G03C *1/02, 1/28, 1/34*

U.S. Cl. 430—569 **19 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, said silver halide emulsion layer containing a rhodium salt in an amount sufficient to increase a contrast thereof, and said silver halide emulsion layer or a layer adjacent thereto containing a compound represented by formula (I) or (II)



(I)

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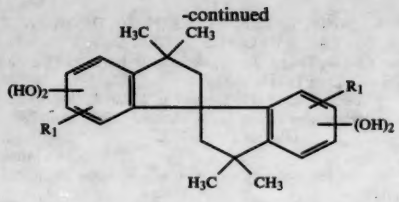


(II)

wherein R_1 represents hydrogen or a substituted or unsubstituted alkyl group.

4,346,168

PROCESS FOR THE PREPARATION OF PENICILLIN DERIVATIVES

Martin Cole, and Robert A. Edmondson, both of Dorking, England, assignors to Beecham Group Limited, England

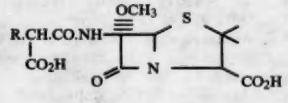
Filed May 13, 1980, Ser. No. 149,343

Claims priority, application United Kingdom, May 15, 1979, 7916921

Int. Cl.³ C12P *37/00*

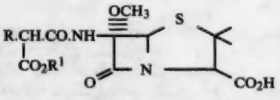
U.S. Cl. 435—43 **6 Claims**

1. A process for the preparation of a 6α-methoxy penicillin of formula (I):



(I)

wherein R represents phenyl or 2- or 3-thienyl, which process comprises subjecting a compound of formula (IV):



(IV)

where R^1 is an ester-forming radical, to the action of the enzyme α-chymotrypsin or an esterase-producing strain of Streptomyces sp.

4,346,169

METHOD FOR PRODUCTION OF L-ARGININE BY FERMENTATION

Kunihiko Akashi, Saga; Yayoi Nakamura, Ayase; Takayasu Tsuchida, Kawasaki; Hiroe Yoshii, and Shigeho Ikeda, both of Yokohama, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Sep. 15, 1980, Ser. No. 187,146

Int. Cl.³ C12P *13/10*

U.S. Cl. 435—114 **5 Claims**

1. A method for the production of L-arginine by fermentation which comprises:

(1) culturing aerobically in a culture medium a mutant capable of producing L-arginine of the genus Brevibacterium or Corynebacterium, and

(2) recovering the L-arginine accumulated in the culture medium; said mutant being resistant to Keto-malonic acid, fluoro-malonic acid, monofluoro-acetic acid or aspartate-antagonist,

wherein said mutant belongs to the species *Brevibacterium flavum* or *Corynebacterium acetoacidophilum* selected from the class consisting of

-continued

Brevibacterium flavum	NRRL B-12235
Brevibacterium flavum	NRRL B-12236
Brevibacterium flavum	NRRL B-12237
Brevibacterium flavum	NRRL B-12240
Brevibacterium flavum	NRRL B-12242
Brevibacterium flavum	NRRL B-12243
Brevibacterium flavum	NRRL B-12244
Brevibacterium flavum	NRRL B-12241
Brevibacterium flavum	NRRL B-12247
Corynebacterium acetoacidophilum	NRRL B-12238
Corynebacterium acetoacidophilum	NRRL B-12239
Corynebacterium acetoacidophilum	NRRL B-12245
Corynebacterium acetoacidophilum	NRRL B-12246

4,346,170

METHOD FOR PRODUCING L-LYSINE BY FERMENTATION

Kounosuke Sano, Tokyo, and Takayasu Tsuchida, Kawasaki, both of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Jul. 23, 1980, Ser. No. 171,317

Claims priority, application Japan, Jul. 23, 1979, 54-93533

Int. Cl.³ C12P *13/08*; C12N *15/00, 1/20, 1/00*

U.S. Cl. 435—115 **17 Claims**

1. An L-lysine producing organism which is obtained by incorporation into a host strain of the genus Escherichia of a hybrid vector having inserted therein a DNA fragment with genetic information controlling L-lysine production, which fragment is derived from a donor strain of the genus Escherichia which is resistant to an L-lysine analogue.

4,346,171

FERMENTATION PROCESS FOR PRODUCING COMPOUND HAVING ANTHELMINTIC AND ACARICIDAL ACTIVITIES

Yo Takiguchi; Hiroshi Mishima, both of Tokyo; Shinjiro Yamamoto, Shiga, and Michiya Terao, Tokyo, all of Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

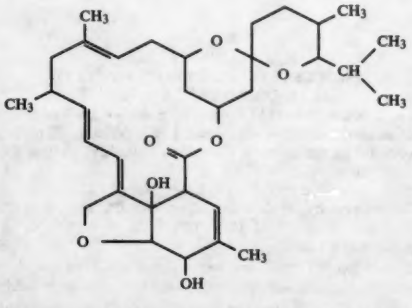
Filed Aug. 18, 1980, Ser. No. 179,479

Claims priority, application Japan, Aug. 23, 1979, 54-107550

Int. Cl.³ C12P *17/18*

U.S. Cl. 435—119 **11 Claims**

1. A process for preparing Compound B-41D having the formula



which comprises cultivating Streptomyces strain B-41-146 or a compound B-41D-producing mutant thereof in a culture medium therefor containing skimmed milk to form the Compound B-41D and isolating the Compound B-41D.

4,346,172

ELECTROCHEMICAL PROCESS AND APPARATUS TO CONTROL THE CHEMICAL STATE OF A MATERIAL

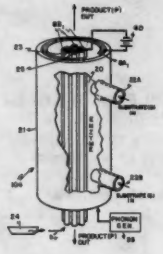
Mitchell R. Swartz, Malden, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 911,625, Jun. 1, 1978, Pat. No. 4,243,751, which is a division of Ser. No. 636,290, Nov. 28, 1975, Pat. No. 4,139,348. This application Apr. 18, 1980, Ser. No. 141,636

The portion of the term of this patent subsequent to Jun. 6, 1998, has been disclaimed.

Int. Cl.³ G01N *27/26, 27/28, 33/16;* A61B *10/00*

U.S. Cl. 435—168 34 Claims



1. In a process wherein a chemical change is wrought upon a material as a consequence of it having been subjected to a reaction or reactions, which chemical change is an unwanted chemical deterioration resulting from a reversible reaction which can be counteracted by introducing appropriate charge carriers, electrons or holes, into the electronic states of said material, the further steps of adding small amounts of a dye or quinone electroactive mediator to the material to facilitate the charge carrier transfer to said electronic states, the resulting material being a matrix material and the electroactive mediator, introducing photons to the resulting material, the electroactive mediator being one which permits, in the presence of said photons, charge carrier transfer to the resulting material at an applied electric potential difference that is below the electrolysis potential of the resulting material, and applying an electric potential below the electrolysis potential across the resulting material to inject appropriate charge carriers into the resulting material and into the electronic states thereof to counteract the unwanted chemical deterioration and cause the material to revert to a desired state.

4,346,173

PROCESS FOR THE PRODUCTION OF ACYL-COENZYME A OXIDASE

Shigeru Ikuta; Shigeyuki Imamura; Hidehiko Ishikawa; Kazuo Matsuura; Masaki Takada, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 27, 1980, Ser. No. 201,123

Claims priority, application Japan, Oct. 26, 1979, 54-139166

Int. Cl.³ C12N *9/02*

U.S. Cl. 435—189 7 Claims

1. A process for the production of acyl-Coenzyme A oxidase, which comprises culturing an acyl-Coenzyme A-oxidase-producing microorganism belonging to genus Macrophomina, genus Cladosporium, genus Aspergillus, genus Monascus, genus Saccharomyces or genus Arthrobacter in a nutrient medium, and isolating the thus-formed acyl-CoA oxidase therefrom.

4,346,174

PROCESS FOR ISOLATING SUPEROXIDE DISMUTASE FROM RED BLOOD CELLS

Takamasa Yasuda, Tokyo, Japan, assignor to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,392

Claims priority, application Japan, Jun. 23, 1980, 55-83920

Int. Cl.³ C12N *9/02*

U.S. Cl. 435—189 19 Claims

1. A process for isolating superoxide dismutase from red blood cells comprising:

(a) heating hemolyzed red blood cells in the presence of at least one monovalent inorganic neutral salt and at least one transition metal salt to form a first supernatant solution and a first precipitate;

(b) removing said first precipitate;

(c) heating said first supernatant solution in the presence of at least one transition metal salt in an amount sufficient to form a clear supernatant solution and a second precipitate; and

(d) removing said second precipitate.

4,346,175

PROCESS FOR THE MICROBIOLOGICAL MODIFICATION OF HARDWOOD BY THE ACTION OF MICROORGANISMS

Sven-Olof Enfors, Mellanvägen 4, Stanstorp, S-243 00 Höör; Nils Molin, Clementstorget 12, S-222 Lund, and Eugen Montelin, Majorsgatan 41, S-290 Ahus, all of Sweden, assignors to Sven-Olof Enfors, Hoor; Nils Molin, Lund and Eugen Montelin, Ahus, all of, Sweden

Filed Oct. 3, 1978, Ser. No. 948,275

Claims priority, application Sweden, Oct. 4, 1977, 7711089

Int. Cl.³ C12P *1/02*

U.S. Cl. 435—317 14 Claims

1. A process for the controlled microbiological modification of hardwood to produce a wood product of high porosity by the action of microorganisms, wherein an aerobic microorganism selected from the group consisting of *Armillaria mellea, Xylaria polymorpha, Bacillus polymyxa,* and an enzymatically active preparation thereof, specially selected for the hardwood in question, is implanted in a sufficient amount in or on the surface of the wood for attack thereof, and wherein the temperature moisture content in the wood, O_2 content and CO_2 content are adjusted in relation to the selected microorganism or enzymatically active preparation thereof, selective modification of the hardwood being thereby realized, and wherein the process is discontinued in a suitable manner.

4,346,176

GLASS FOR OPTICAL FIBER

Terutoshi Kanamori, and Toyotaka Manabe, both of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Jan. 14, 1981, Ser. No. 225,094

Claims priority, application Japan, Feb. 13, 1980, 55/15417

Int. Cl.³ C03C *3/12, 13/00*

U.S. Cl. 501—37 13 Claims

1. Fluoride glass for an optical fiber having good transmittance with a low transmission loss in the infrared region consisting essentially of 10 to 64 mol % of at least one fluoride selected from a first group consisting of CaF_2, SrF_2 and BaF_2; 0.5 to 50 mol% of at least one fluoride selected from a second group consisting of YF_3 and the fluorides of the lanthanide elements; and 30 to 65 mol % of AlF_3.

4,346,177

PULVERULENT COMPOSITIONS AND REFRACTORY ARTICLE OBTAINED WITH SAID COMPOSITION

Gerard Cochet, Plaisir, and Gilbert Provost, Les Breviaires, both of France, assignors to Societe Anonyme dite: Carbonisation Entreprise et Ceramique, Montrouge, France

Filed Nov. 18, 1980, Ser. No. 208,023
Claims priority, application France, Nov. 19, 1979, 79 28418
Int. Cl.³ C04B 35/02
U.S. Cl. 501—123 5 Claims

1. A pulverulent composition for admixture with a refractory aggregate and water, and for molding without hydraulic bonding, so as to provide pressed refractory articles, including bricks for the construction of thermal enclosures, comprising as a first portion, 70–96% by weight of silica, either vitreous or amorphous, of which the particles have a diameter lower than 1 μm; as a second portion, 4–30% by weight of a compound capable of supplying 1–20% by weight of alkaline earth oxide; and as a third portion, 0.5–3% by weight of a fluidizing or dispersing agent.

4,346,178

STRUCTURED KAOLIN AGGLOMERATES AND METHODS OF MAKING THE SAME

Peter Economou, Millington, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.

Filed Jul. 27, 1981, Ser. No. 287,026
Int. Cl.³ C09C 3/08
U.S. Cl. 501—148 15 Claims

1. An opacifying pigment for paper coating and paper filler applications comprising structured agglomerates of clay platelets stabilized with urea-formaldehyde polymeric submicron size particles.

4,346,179

PRODUCTION OF ALCOHOLS FROM SYNTHESIS GASES

Andre Sugier; Edouard Freund, and Jean-Francois Le Page, all of Rueil Malmaison, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1980, Ser. No. 137,098
Claims priority, application France, Apr. 5, 1979, 79 08881
Int. Cl.³ C07C 27/06, 31/02, 31/04
U.S. Cl. 518—707 20 Claims

1. A process for manufacturing a mixture of methanol and saturated, mainly linear primary homolog alcohols, said mixture being suitable for direct use as a component of automotive gasoline, said process comprising the steps of:

(1) passing a synthesis gas comprising carbon dioxide, carbon monoxide and hydrogen through a first catalytic zone, at a temperature of 230°–350° C., under conditions favoring the synthesis of a mixture of methanol and saturated, mainly linear primary homolog alcohols;

(2) cooling the resultant effluent, separating the resultant liquid phase from the unconverted gas phase, and removing water from the liquid phase to produce a first liquid phase containing methanol and a mixture of saturated, mainly linear primary homolog alcohols comprising mainly ethanol and propanol;

(3) passing at least a portion of the separated gas phase from step (2) through a second catalytic zone, at a temperature of 240°–300° C., under conditions favoring the synthesis of only methanol;

(4) cooling the effluent from the second catalytic zone, separating the resultant liquid phase from the unconverted gas phase, and removing water from the liquid phase to produce a second liquid phase containing at least about 97% by weight of methanol; and

(5) combining said first liquid phase with said second liquid phase to produce a product mixture containing 74–90% by weight of methanol and 10–26% by weight of saturated, mainly linear primary homolog alcohols; said product mixture being suitable for direct use as a component of automotive gasoline.

4,346,180

PROCESS FOR THE PRODUCTION OF ORGANIC ALKALI METAL SILICATE COMPOUNDS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 251,132, Apr. 6, 1981, Pat. No. 4,321,184, which is a continuation-in-part of Ser. No. 146,474, May 5, 1980, Pat. No. 4,273,908, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,073,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Dec. 10, 1981, Ser. No. 329,405
Int. Cl.³ C08J 9/00
U.S. Cl. 521—100 9 Claims

1. The process for the production of foamed polyurethane silicate resinous product by the following steps:

(a) mixing and reacting 5 to 100 parts by weight of an oxidated silicon compound selected from the group consisting of hydrated silica, sodium silicate, potassium silicate, natural oxidated silicon compounds containing free silicic acid acid radicals and mixtures thereof, 50 to 100 parts by weight of an alkali metal compound selected from the group consisting of alkali metal hydroxide, alkali metal carbonates and mixtures thereof in an aqueous solution and an organic compound which is attached to a substituent which will split off during the reaction is a substituted hydrocarbon which contains a substituent selected from the group consisting of halogen, acid sulfate, nitrate, acid phosphate, bicarbonate, formate, acetate, propionate, laurate, oleate, stearate, oxalate, acid malonate, acid tartrate, acid citrate and mixtures thereof in an amount wherein the substituted radicals are about equal to the alkali metal radicals thereby producing an organic alkali metal silicate; then

(b) adding and mixing 50 to 100 parts by weight of an organic polyisocyanate and up to 50% by weight of a chemically inert blowing agent, boiling within the range of from −25° C. to 80° C. and allowing the mixture to react thereby.

(c) producing a foamed polyurethane silicate resinous product.

4,346,181

METHOD OF REDUCING FORMALDEHYDE EMISSIONS FROM FORMALDEHYDE CONDENSATION POLYMERS

George G. Allan, Seattle, Wash., assignor to Board of Regents, University of Washington, Seattle, Wash.

Continuation of Ser. No. 137,990, Apr. 4, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,037
Int. Cl.³ C08J 9/30
U.S. Cl. 521—136 2 Claims

1. A method of reducing formaldehyde emissions from a foamable aqueous solution of a urea-formaldehyde condensation polymer, consisting essentially of:

providing an aqueous urea-formaldehyde polymer having a molar ratio of formaldehyde to urea ranging from 1:1 to 1:2.5, and

incorporating in the urea-formaldehyde polymer a minor amount of an acrylamide polymer selected from the group consisting of acrylamide and methacrylamide or a combination of the two which react with free formaldehyde present in the urea-formaldehyde polymer or formaldehyde generated as a result of hydrolysis of the polymer during use to reduce liberation of free formaldehyde from the polymer.

4,346,182

POLYIMIDES

John Gagliani, and Raymond Lee, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 254,137, Apr. 14, 1981. This application Apr. 14, 1981, Ser. No. 254,138

Int. Cl.³ C08J 9/00; C08G 18/16

U.S. Cl. 521—189 10 Claims

1. A foamable terpolyimide precursor comprising an essentially stoichiometric mixture of an alkyl ester of 3,3',4,4'-benzophenonetetracarboxylic acid or a mixture of such esters and at least three diamines, one of said diamines being heterocyclic, a second of said diamines being aromatic, a third of said diamines being aliphatic, and said precursor containing from 0.05 to 0.5 mole of aliphatic diamine and from 0.05 to 0.9 mole of heterocyclic diamine per mole of benzophenonetetracarboxylic acid ester(s).

4,346,183

METHACRYLATE POLYMER MIX CONTAINING ALKALINE EARTH METAL RESINATE

Thomas J. Hyde, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 136,912, Apr. 3, 1980, abandoned. This application Jul. 29, 1981, Ser. No. 288,006

Claims priority, application Japan, Apr. 3, 1981, 56-49487

Int. Cl.³ C08L 93/00

U.S. Cl. 523—200 5 Claims

1. An improved methacrylate polymer concrete slurry consisting essentially of

(a) particulate inorganic filler containing silica

(b) a methacrylate polymerization initiator

(c) a plasticizer for methacrylate polymer

(d) methacrylate polymer

(e) methacrylate monomer

(f) paraffinic oil, and

(g) a methacrylate polymerization promotor,

in which the improvement comprises the presence in the slurry of 0.03 to 0.60% by weight of slurry of an alkaline earth metal resinate.

4,346,184

COATING COMPOSITIONS FOR INHIBITING CORROSION OF METAL SURFACES

Cyril F. Drake, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 912,129, Jun. 2, 1978, Pat. No. 4,210,575. This application Nov. 13, 1980, Ser. No. 206,426

Claims priority, application United Kingdom, Nov. 15, 1979, 7939544

Int. Cl.³ C08L 63/00, 67/00, 35/00

U.S. Cl. 523—451 25 Claims

1. A water soluble glass composition consisting essentially of 54.6 to 63.3 mol % zinc oxide, 35.8 to 45.3 mol % phosphorus pentoxide, the remainder comprising at least 0.1 mol % aluminum oxide.

10. A paint composition adapted to inhibit corrosion of a metal surface to which it is applied, the composition including a water soluble glass composition dispersed in a paint binder in which said glass composition comprises 54.6 to 63.3 mol % zinc oxide, 35.8 to 45.3 mol % phosphorus pentoxide, the remainder comprising at least 0.1 mol % aluminum oxide.

18. A process of inhibiting the corrosion of a metal surface comprising

coating said surface with a paint composition containing a water soluble glass composition dispersed in a paint binder in which said glass composition comprises from 35.8 to 45.3 mol % phosphorus pentoxide and from 54.6 to 63.3 mol % zinc oxide as its major constituents which together provide the glass forming oxide and glass modifying oxide respectively of said glass, said glass also comprising a minor proportion of aluminum oxide.

4,346,185

PROCESS FOR THE PRODUCTION OF ALKALI METAL UNSATURATED POLYESTER SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 122,015, Feb. 19, 1980, which is a continuation-in-part of Ser. No. 10,061, Feb. 7, 1979, Pat. No. 4,200,697, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Jul. 6, 1981, Ser. No. 280,782

Int. Cl.³ C08L 67/00

U.S. Cl. 524—5 16 Claims

1. The process for the production of alkali metal unsaturated polyester silicate resin by the following steps:

(a) mixing 10 to 30 parts by weight of a polyhydroxyl organic compound and 10 to 30 parts by weight of an unsaturated polycarboxylic compound selected from the group consisting of polycarboxylic acid, polycarboxylic acid anhydride and mixtures thereof,

(b) adding slowly 1 to 10 parts by weight of alkali metal silicate to the mixture while agitating and heating the mixture at a temperature between the melting temperature of the unsaturated polycarboxylic acid compound and the boiling temperature of the polyhydroxyl organic compounds while agitating for 20 to 90 minutes, thereby

(c) producing an alkali metal unsaturated polyester silicate resinous product,

(d) adding a vinyl monomer, selected from the group consisting of vinyl acetate, styrene, methacrylic acid, methyl methacrylate, vinyl toluene, acrylic acid, acrylonitrile, divinyl benzene and mixtures thereof, in the amount of 20 to 50 percent by weight, percentage based on the weight of the alkali metal unsaturated polyester resinous product, thereby,

(e) producing an alkali metal unsaturated polyester silicate resin.

14. The process of claim 1 wherein an additional step is taken after step (e) of claim 1 wherein up to two parts by weight of a water-binding agent selected from the group consisting of hydraulic cement, synthetic anhydride, gypsum and burnt lime, 1 part by weight of the alkali metal unsaturated polyester silicate resin of step (e) of claim 1, up to 25% by weight of water, percentage based on the weight of the water-binding agent, and a catalytic amount of a peroxide initiator and an activator are added, thoroughly mixed and reacted.

4,346,186

PROCESS FOR FIXING PHOTO-INDUCED COLORED DERIVATIVES OF SPIROPYRANS AND COMPOSITIONS THEREFOR

Thomas B. Garrett, Warwick Township, Lancaster County; John E. Herweh; Alan B. Magnusson, both of East Hempfield Township, Lancaster County, and Normal L. Miller, Manheim Township, Lancaster County, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 189,031, Sep. 22, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,455

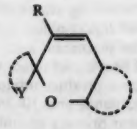
Int. Cl.³ C08K 5/00

U.S. Cl. 524—82 22 Claims

1. A process for fixing spiropyrans in their colored form, said process comprising the steps of:

preparing a solvent solution comprising

(a) a spiropyran having the formula



wherein Y represents NR, O or S and each R independently represents H, alkyl or alkenyl, and

(b) an iodonium salt, said solvent solution comprising from about 0.1 to about 10 moles of iodonium salt for every one mole of spiropyran, and

irradiating said solvent solution with a sufficient dose of ultraviolet radiation to fix said spiropyran in its colored form.

4,346,187

FLAME RETARDANT POLYPROPYLENE COMPOSITIONS CONTAINING TRITYL SYNERGISTS

George M. Nichols, Evantson, Ill., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation-in-part of Ser. No. 853,617, Nov. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 788,187, Apr. 18, 1977, abandoned, Ser. No. 801,174, May 27, 1977, abandoned, and Ser. No. 788,185, Apr. 18, 1977, abandoned. This application Mar. 8, 1979, Ser. No. 18,700

Int. Cl.³ C08K *5/13, 5/09, 5/06, 5/05, 5/47, 5/34, 5/18, 5/36*

U.S. Cl. 524—83 19 Claims

1. In a flame retardant polypropylene composition comprising polypropylene and an organic bromine flame retardant compound, the improvement wherein a trityl synergist is included therein, said trityl synergist having a structure selected from the group consisting of

Trityl-X and Trityl—A—R_1

wherein X is selected from the group consisting of —F, —Cl, —Br, —NCS and —N_3; and

wherein A is selected from the group consisting of —O—, —S— and —NH—; and

wherein —R_1 is —H or a carbon-containing radical attached through a carbon atom to —A—.

4,346,188

POLYOLEFIN COMPOSITIONS STABILIZED AGAINST UV-RADIATIONS BY PYRROLIDINE DERIVATIVES

Silvestro Costanzi, San Giuliano Milanese; Francesco Tessarolo, Monza; Adriano Ballabio, Giussano, and Maurizio Brunelli, Milan, all of Italy, assignors to ANIC, S.p.A., Palermo, Italy

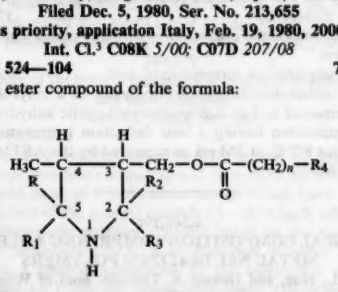
Filed Dec. 5, 1980, Ser. No. 213,655

Claims priority, application Italy, Feb. 19, 1980, 20002 A/80

Int. Cl.³ C08K *5/00;* C07D *207/08*

U.S. Cl. 524—104 7 Claims

1. An ester compound of the formula:



wherein R, R_1, R_2 and R_3 are methyl radicals, R_4 is hydrogen or a carboxyester radical which is the same as the esterified group which contains the pyrrolidine ring, and n is 4 or 17, R_4 being hydrogen where n is 17 and being a carboxyester which is the same as the esterified group which contains the pyrrolidine ring where n is 4.

4,346,189

AGENT FOR FORMING CLEANER CUTTING PRESSURE SENSITIVE ADHESIVES

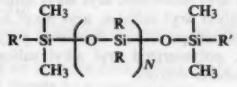
Jacques J. Laurent, Soignies, Belgium, assignor to Morgan Adhesives Company, Stow, Ohio

Filed Jul. 14, 1980, Ser. No. 168,507

Int. Cl.³ C08L *9/00*

U.S. Cl. 524—267 10 Claims

1. A pressure sensitive adhesive composition comprising the solids deposited from a mixture of synthetic rubber, and tackifiers and also including a silicone additive in the amounts of from about 6 to 10 percent of the resultant composition and where the silicone is a polysiloxane that has the formula of;



and where R is either a methyl, a phenyl, a vinyl or a silicon bounded hydrogen group and R′ is selected from the group consisting of either a methyl, or a hydroxyl group, and N is from 16 to 150, and the viscosity of said polysiloxane is from about 20 to about 350 centistokes.

4,346,190

THICKENED ACRYLIC POLYMER LATICES

Eugene S. Barabas, Watchung; Andrew Klein, Somerville, and Dru W. Alwani, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 773,503, Feb. 18, 1977, Pat. No. 4,110,291. This application Aug. 28, 1978, Ser. No. 937,312

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.³ C08L *33/02*

U.S. Cl. 524—522 4 Claims

1. An acrylic polymer latex containing an effective thickening amount of a different acrylic copolymer latex prepared by inducing, at a temperature of about 5° C. to about 80° C., a redox-initiated polymerization in an aqueous dispersion of initially, as monomers, (1) about 50 to about 65 wt% of methacrylic acid or ethacrylic acid, and (2) about 35 to about 50 wt% of methylacrylate.

4,346,191

PROCESS FOR THE PRODUCTION OF AMINE POLYSULFIDE SILICATE REACTION PRODUCTS AND THEIR REACTION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 104,577, Dec. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 19,178, Mar. 9, 1979, Pat. No. 4,197,229, which is a continuation-in-part of Ser. No. 921,728, Jul. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 881,247, Feb. 27, 1978, abandoned. This application Mar. 3, 1981, Ser. No. 240,001

Int. Cl.³ C08K *5/49*

U.S. Cl. 524—710 27 Claims

1. The process for the production of alkali metal amine polysulfide silicate reaction product by mixing and heating the following components:

A. sulfur containing compound selected from the group consisting of sulfur, alkali metal sulfides, alkali metal polysulfides, alkaline earth metal polysulfides and mixtures thereof, in an amount of 1 to 4 parts by weight,

B. alkali metal hydroxide in an amount of 2 parts by weight,

C. organic polyamine, in the amount of 0.05 to 4 parts by weight,

D. oxidated silicon compound, in the amount of 1 to 2 parts by weight, at a temperature just above the melting point of sulfur until the reaction is substantially complete.

8. The process of claim 1 wherein additional steps are taken wherein the alkali metal amine polysulfide silicate reaction

product is added to water containing 1% to 5% of an emulsifying or dispersing agent to produce an aqueous solution containing 10% to 70% by weight of the reaction product; then a substituted organic compound having at least two carbon atoms, each of which is attached to a substituent which will split off during the reaction, is added to said aqueous solution in the amount wherein the mols of the substituted radicals of the substituted organic compound in the mixture are about equal to the mols of the alkali metal radicals in the mixture, which is then agitated until the reaction is substantially complete, thereby producing an aqueous dispersion of poly(organic amine polysulfide silicate) resinous product.

10. The process of claim 8 wherein the emulsifying or dispersing agent is selected from the group consisting of lignin sulfonate, alkyl aryl sulfonates, aryl alkyl sulfonates, sorbitan monolaurates, alkyl aryl sulfates, aryl alkyl sulfates, methyl cellulose, sulfonated petroleum fractions, polymerized alkyl aryl sulfonates, polymerized aryl alkyl sulfonates, soybean lecithin and mixtures thereof.

4,346,192

PROCESS FOR THE PRODUCTION OF ORGANIC ALKALI METAL SILICATE COMPOUNDS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 251,132, Apr. 6, 1981, Pat. No. 4,321,184, which is a continuation-in-part of Ser. No. 146,474, May 5, 1980, Pat. No. 4,273,908, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, Pat. No. 4,097,424, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,073,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Dec. 7, 1981, Ser. No. 328,198

Int. Cl.³ C08K *3/34, 3/36*

U.S. Cl. 524—788 **9 Claims**

1. The process for the production polyurethane silicate resinous product by the following steps:

(a) mixing and reacting 5 to 100 parts by weight of an oxidated silicon compound selected from the group consisting of hydrated silica, sodium silicate, potassium silicate, natural oxidated silicon compounds containing free silicic acid radicals and mixtures thereof, 50 to 100 parts by weight of an alkali metal compound selected from the group consisting of alkali metal hydroxide, alkali metal carbonates and mixtures thereof in an aqueous solution and an organic compound which is attached to a substituent which will split off during the reaction is a substituted hydrocarbon which contains a substituent selected from the group consisting of halogen, acid sulfate, nitrate, acid phosphate, bicarbonate, formate, acetate, propionate, laurate, oleate, stearate, oxalate, acid malonate, acid tartrate, acid citrate and mixtures thereof in an amount wherein the substituted radicals are about equal to the alkali metal radicals thereby producing an organic alkali metal silicate; then

(b) adding and mixing 50 to 100 parts by weight of an organic polyisocyanate and allowing the mixture to react thereby,

(c) producing a polyurethane silicate resinous product.

4,346,193

CONTINUOUS PROCESS FOR MAKING STAR-BLOCK COPOLYMERS

David R. Warfel, Exton, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 4, 1981, Ser. No. 260,150

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—52 **4 Claims**

1. A continuous anionic solution polymerization process for producing star-block copolymers in a continuous tubular reactor having internal zones defined by a sequence of four static mixers, each of which is maintained at a temperature of from 65° to 85° C. and each has a means for introducing new matter at the inlet of the mixer, and the tubular reactor having a pressure control valve mounted after the last mixer to maintain the reactor in a liquid full mode at all times, said process consisting essentially of the steps of

(a) continuously feeding to a first static mixer a solution of vinyl aromatic compound in an inert solvent and a solution of hydrocarbyllithium initiator in an inert solvent at a rate such that the time of flow of the solutions through the first mixer is between 6 and 15 minutes;

(b) continuously feeding to a second static mixer a conjugated diene monomer, at sufficient pressure to ensure the diene is in the liquid state, at a rate such that the time of flow through the second mixer is between 25 and 55 minutes;

(c) continuously feeding to a third static mixer a multifunctional coupling agent at a rate such that the time of flow through the third mixer is between 25 and 55 minutes;

(d) continuously feeding to a fourth static mixer a terminating agent;

(e) continuously removing the reaction product from the tubular reactor through the pressure control valve; and

(f) separating the resulting star-block copolymer from the inert solvent.

4,346,194

TOUGHENED POLYAMIDE BLENDS

Miguel J. Roura, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 114,240, Jan. 22, 1980, abandoned. This application Oct. 20, 1980, Ser. No. 198,356

Int. Cl.³ C08L *77/00*

U.S. Cl. 525—66 **3 Claims**

1. A polyamide blend comprising:

(a) 60–90% by weight polyamide which is a mixture of 20–80% by weight 66 nylon and complementally 80–20% by weight 6 nylon, and complementally

(b) 3–40% by weight of a polymeric toughening agent that is an adduct of a polymer of ethylene, at least one C_3–C_6 α-olefin and at least one nonconjugated diene, with an unsaturated compound containing carboxyl or carboxyl derivatives.

4,346,195

POLYETHYLENE TEREPHTHALATE BLENDS

Edwin D. Hornbaker, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 162,138, Jun. 23, 1980. This application Sep. 14, 1981, Ser. No. 301,935

Int. Cl.³ C08L *67/02*

U.S. Cl. 525—176 **17 Claims**

1. A thermoplastic composition which comprises in intimate admixture:

(a) a polyethylene terephthalate, and

(b) a rubber-modified graft copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride;

said composition having a heat deflection temperature of at least about 80° C. at 264 psi as measured by the ASTM procedure D 648-72.

4,346,196

HEAT SEAL COMPOSITION COMPRISING A BLEND OF METAL NEUTRALIZED POLYMERS

George L. Hoh, and Donald A. Vassallo, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 10, 1980, Ser. No. 185,728

Int. Cl.³ C08L *23/26, 31/04, 33/02, 33/06*

U.S. Cl. 525—196 **5 Claims**

1. A substantially homogeneous blend of polymeric materials comprising:

(a) 20 to 80 percent, by weight, of a terpolymer having, as monomeric components,
(i) 65 to 95 percent, by weight, ethylene,
(ii) 4 to 30 percent, by weight, vinyl alkanoate or an ester selected from the group consisting of alkyl acrylate, and alkyl methacrylate wherein the alkanoic acid moiety of the alkanoate and the alkyl group have one to four carbon atoms, and
(iii) 0.5 to 20 percent, by weight, ethylenically unsaturated monocarboxylic acid selected from the group consisting of acrylic acid and methacrylic acid; and
(b) 20 to 80 percent, by weight, of an ionomer having, as monomeric components,
(i) 75 to 99 percent, by weight, ethylene,
(ii) 1 to 25 percent, by weight, ethylenically unsaturated monocarboxylic acid selected from the group consisting of acrylic acid and methacrylic acid

wherein the sum of the weight percentages of comonomers (ii) and (iii) in the terpolymer is at least eight percentage points higher than the weight percentage of comonomer (ii) in the ionomer and wherein 5 to 40 percent of the carboxylic acid in the blend is neutralized by zinc ions.

4,346,197

METHOD OF POLYMERIZING BLENDS OF BIS (ALLYL CARBONATE) MONOMERS WITH POLYMERS AND POLYMER BLENDS PREPARED THEREBY

John C. Crano, and Ronald L. Haynes, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1980, Ser. No. 219,063
Int. Cl.³ C08L *47/00*
U.S. Cl. 525—277 **20 Claims**

1. A method of forming a polymerizate of a bis(allyl carbonate) comprising:
forming a monomeric composition comprising the bis(allyl carbonate) monomer, a polymer having a viscosity average molecular weight above 100,000 of an olefinically unsaturated monomer, and an initiator,
forming a fabricable pseudoplastic resin having a shear stress of 10^3 to 10^7 dynes per square centimeter at shear rates of 10^1 to 10^4 per second;
working the fabricable resin; and
thereafter curing the fabricable resin to form a polymerizate.

4,346,198

CLEAR IMPACT RESISTANT THERMOPLASTIC STAR-BLOCK COPOLYMERS

Kenneth Doak, Murrysville; Le-Khac Bi, West Chester, and Ralph Milkovich, Paoli, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 167,883, Jul. 14, 1980, abandoned, which is a continuation of Ser. No. 35,047, May 1, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,279
The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.
Int. Cl.³ C08F *297/04*
U.S. Cl. 525—314 **6 Claims**

1. Star-block copolymers, of from 60 to 90% by weight of a monovinyl aromatic compound and 40 to 10% by weight of a conjugated diene of 4 to 8 carbon atoms, which have an average structure of the general formula $(A—B/A')_m X$ where A is a non-elastomeric polymer segment based on the monovinyl aromatic compound, B/A′ is an elastomer polymer segment based on a random copolymer of the monovinyl aromatic compound (A′) and the conjugated diene (B) wherein the weight ratio of A′ to B must be less than 1.0, m is an integer between 8 and 12, and X is the radical of a polyfunctional coupling agent by means of which the linear polymer blocks (A—B/A′) are chemically bonded to form the star-block copolymers, wherein said segment A contains 80 to 95% by weight of the total monovinyl aromatic compound, and segment B/A′ contains no significant blocks of either monovinyl aromatic compound or conjugated diene.

4,346,199

PROCESS FOR A POLYMERIC POLYBLEND COMPOSITION COMPRISING A MATRIX PHASE TERPOLYMER OF ALKENYL AROMATIC ALKENYL NITRILE AND MYRCENE MONOMERS AND A DIENE RUBBER PHASE GRAFTED WITH SAID MONOMERS

Fred M. Peng, Longmeadow, Mass., and Edward F. Tokas, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 30, 1981, Ser. No. 307,257
Int. Cl.³ C08F *279/02*
U.S. Cl. 525—316 **23 Claims**

1. A process for preparing polymeric polyblends comprising the steps:
A. charging an aqueous latex having diene rubber particles dispersed therein to a reaction zone,
B. mixing a monomer formulation of alkenyl aromatic, alkenyl nitrile and myrcene with said latex, said myrcene being present in about 1 to 30% by weight of said monomer formulation,
C. polymerizing said monomers in the presence of said latex such that said rubber particles become grafted with at least a portion of said monomers while said monomers form a matrix polymer phase of said monomers, and
D. separating said matrix polymer having said grafted rubber particles dispersed therein from said latex forming said polymeric polyblend.

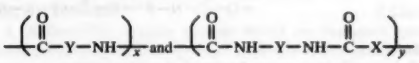
4,346,200

THERMOPLASTIC POLYAMIDE COMPOSITIONS

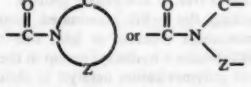
James C. Woodbrey, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1980, Ser. No. 220,939
Int. Cl.³ C08L *77/00*
U.S. Cl. 525—421 **12 Claims**

1. A composition comprising:
(a) at least one polyamide resin of number average molecular weight of at least 5000; and
(b) at least one block polymer having
(i) from about 30 to about 70 weight percent polyamide segments selected from



wherein x is an integer equal to five or more and y is an integer equal to three or more;
(ii) from about 70 to about 30 weight percent of segments having a molecular weight of at least 300 selected from the group consisting of segments of poly(ethylene oxide), poly(propylene oxide), polycaprolactone, polytetrahydrofuran, polybutadiene, polyisoprene, polyisobutylene, poly(C_1–C_8 alkylene acrylate), poly(C_1–C_4 dialkylene siloxane), poly(ethylene-co-propylene), poly(ethylene-co-carbon monoxide) and combinations thereof; said (ii) segments being connected to an (i) polyamide segment through groups selected from amide, ester, urea, carbamate and imide; and
(iii) greater than 0.05 milliequivalents of



groups per gram of (b); wherein Y and Z are alkylene having from about 3 to about 14 carbon atoms and X is arylene or alkylene having from about 3 to about 14 carbon atoms;

provided that the composition contains from about 10 to about 90 weight percent of Component (a) and from about 90 to about 10 weight percent of Component (b).

4,346,201

POLYMER BLEND OF AN ACRYLIC POLYMER AND A BLOCK POLYMER OF ACRYLIC SEGMENTS AND POLYMERCAPTAN SEGMENT

John A. Simms, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 16,001, Feb. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 823,324, Aug. 10, 1977, abandoned. This application Jan. 28, 1981, Ser. No. 229,160

Int. Cl.³ C08L *75/06, 75/08*

U.S. Cl. 525—440 **20 Claims**

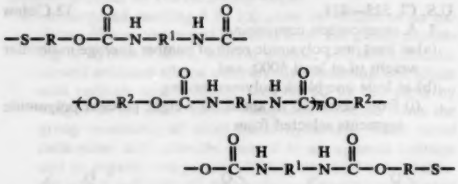
1. A composition comprising a polymer blend

(1) up to 40% by weight, based on the weight of the polymer blend, of a polymer of repeating units of {A} of a hard acrylic segment, wherein the polymer has a number average molecular weight of about 2,000–6,000, contains about 1–5% by weight of hydroxyl groups and has a glass transition temperature of 25° C. and above; and

(2) at least 60% by weight, based on the weight of the polymer blend, of block consisting essentially of the repeating units of {A}{B}{A} wherein

[A] comprises 15–85% by weight, based on the weight of the block polymer, of a hard acrylic segment containing at least one hydroxyl group and having a glass transition temperature of 25° C. and above; and

[B] comprises 85–15% by weight, based on the weight of the block polymer, of a segment that has the formula



where

R is an alkylene group having 2–6 carbon atoms;

R^1 is an aliphatic, a cycloaliphatic or an aromatic group;

R^2 is a polyester segment or a polyalkylene ether segment; and

n is from 0–10;

wherein the block polymer has a number average molecular weight of about 5,000–20,000 and a weight average molecular weight of about 20,000–100,000, contains about 0.1–5.0% by weight of hydroxyl groups and is free of isocyanate groups; wherein the polymer blend is prepared by a process which comprises the steps of

(1) contacting an organic diisocyanate with a polyester or a poly(alkylene ether) glycol at about 40°–125° C. for about 0.5–6 hours to form an isocyanate terminated intermediate;

(2) contacting the isocyanate terminated intermediate with a mercapto alkanol of the formula H—S—R—OH where R has 2–6 carbon atoms to form an —SH terminated intermediate that is free of isocyanate groups;

(3) polymerizing the —SH terminated intermediate with acrylic monomers wherein at least one of the acrylic monomers contains a hydroxyl group in the presence of a free radical polymerization catalyst at about 50°–200° C. for about 1–6 hours to form the polymer blend.

4,346,202

SHORTSTOPPING FREE RADICAL POLYMERIZATION OF OLEFINIC MONOMERS

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 24, 1981, Ser. No. 257,284

Int. Cl.³ C08F *2/42, 2/20*

U.S. Cl. 526—83 **11 Claims**

1. A method of stopping the homopolymerization of vinyl chloride and the copolymerization of vinyl chloride with one or more copolymerizable olefinic monomers having a terminal $CH_2{=}C<$ grouping in the presence of a free-radical yielding catalyst(s) comprising, adding to the polymerization mixture containjng said monomer(s) and said catalyst(s) a shortstopping agent selected from the group consisting of 4,4'-thiodiphenol, the NH_4, Na, K and hi salts of 4,4'-thiodiphenol, acid and salt forms of mixtures of the 4,4'-, 2,2'-, and 2,4'-thiodiphenol isomers, and the monoethanolamine salt of 4,4'-thiodiphenol, said shortstopping agent being employed in an amount greater than ½ the amount of the catalyst(s) charged to the reactor, maintaining the pH of the reaction medium above 7.0, and activating said shortstopping agent by lowering the pH to about 2.0 to about 5.0.

4,346,203

EMULSIFIER FOR THE PREPARATION OF POLYMERS

Adolf Schmidt, Cologne; Helmut Meier; Günther Schedrat, both of Leverkusen, and August Bockmann, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,567

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931674; Apr. 2, 1980, 3012822

Int. Cl.³ C08F *2/26*

U.S. Cl. 526—225 **9 Claims**

1. An emulsifier for the preparation of a polymeric emulsion which comprises at least 50 percent by weight of an alkali metal salt of a polysulphonic acid of an alkane of 8 to 20 carbon atoms and an alkali metal salt of a monosulphonic acid of an alkane of 8 to 20 carbon atoms.

4,346,204

COPOLYMERS CONTAINING HYDROXYL GROUPS, METHOD OF PRODUCTION AND THEIR APPLICATION IN SIZING OF PAPER

Felix Schülde, Wulfen; Karl Peterlein, and Klaus Diedrich, both of Gladbeck, all of Fed. Rep. of Germany, assignors to C Hemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

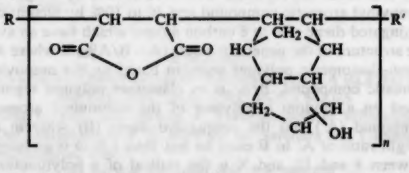
Filed Feb. 14, 1980, Ser. No. 121,507

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905764

Int. Cl.³ C08L *3/02;* **C08F** *22/06*

U.S. Cl. 526—271 **9 Claims**

1. A copolymer of maleic anhydride and dicyclopentadiene, having hydroxy groups, of the formula:



wherein R and R′ may be the same or different radicals selected from the group consisting of hydrogen, C_1–C_{14} alkyl-isobutyronitrile, unsubstituted phenyl or phenyl substituted by halogen or C_1–C_8 alkyl, C_1–C_{14} alkoxy-sub-

stituted benzoyl, C_1–C_{14} acyloxy-substituted benzoyl and halogen-substituted benzoyl, and n=3–10.

4,346,205

ENERGY ABSORBING ELASTOMERS AND COMPOSITES

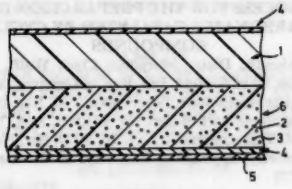
Maurice A. F. Hiles, Welwyn, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 38,307, May 11, 1979, abandoned, which is a continuation of Ser. No. 904,920, May 3, 1978, abandoned, which is a division of Ser. No. 736,936, Oct. 29, 1976, Pat. No. 4,101,704, which is a continuation-in-part of Ser. No. 681,528, Apr. 29, 1976, abandoned. This application May 19, 1980, Ser. No. 150,951

Claims priority, application United Kingdom, Jul. 23, 1976, 30881/76

Int. Cl.³ C08G *18/48, 18/18*

U.S. Cl. 528—53 **24 Claims**



1. An elastomer comprising a flexible polyurethane of essentially linear structure containing unsatisfied hydroxyl groups, and having a compression set less than 15%, an elongation at break of at least 500%, and a recovery which is delayed after compression by at least 0.7 sec, said elastomer comprising the reaction product of substantially linear polyols based on polyalkylene glycol and having an average molecular weight in the range of 600 to 1200, and an aromatic diisocyanate.

13. A method of making a flexible polyurethane elastomer of essentially linear structure containing unsatisfied hydroxyl groups and having a compression set less than 15%, an elongation at break of at least 500%, and a recovery which is delayed after compression by at least 0.7 sec, which method comprises reacting substantially linear polyols based on polyalkylene glycol and having an average molecular weight in the range 600 to 1200 with an aromatic diisocyanate which is in less than stoichiometric amount.

4,346,206

IMIDE PREPOLYMER FROM REACTION OF EPOXY COMPOUND WITH BIS-IMIDE/DIAMINE REACTION MIXTURE

Akio Takahashi, Hitachiioota; Yutaka Itoh, Hitachi; Takeshi Shimazaki, Hitachi; Motoyo Wajima, Hitachi; Hirosada Morishita, Hitachi; Yutaka Mizuno, Shimodate; Shunya Yokozawa, Oyama, and Kenji Tsukanishi, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 176,740

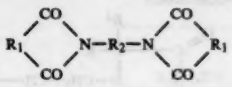
Claims priority, application Japan, Aug. 17, 1979, 54-105241

Int. Cl.³ C08G *59/40, 73/10*

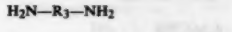
U.S. Cl. 528—88 **3 Claims**

1. A process for preparing an imide prepolymer, which comprises the steps of:

(1) heating, at 70° to 170° C. for 5 to 120 minutes, at least one bis-imide (A) represented by the formula (a):


(a)

wherein R_1 stands for a divalent organic radical having a carbon-carbon double bond, and R_2 stands for a divalent organic radical having at least 2 carbon atoms, and at least one diamine (B) represented by the formula (b):


(b)

wherein R_3 stands for a divalent organic radical having at least 2 carbon atoms, in an organic solvent having a boiling point of 70° to 170° C. as measured under a pressure of 760 mmHg, said at least one bis-imide (A) and said at least one diamine (B) being employed at a molar ratio of the component (A) to the component (B) of from 1:0.1 to 1:1, to obtain a reaction mixture containing an intermediate reaction product which is insoluble or slightly soluble in a low boiling point organic solvent, said solvent having a boiling point no higher than about that of methyl ethyl ketone; and (2) further heating, at 50° to 140° C. for 5 to 120 minutes, the reaction mixture together with at least one 1,2-epoxy compound (C) having at least two 1,2-epoxy groups, said at least one 1,2-epoxy compound (C) being employed in a weight proportion, relative to the total of said at least one bis-imide (A), said at least one diamine (B) and said at least one 1,2-epoxy compound (C), of from 10 to 80%, to obtain a reaction mixture containing an imide prepolymer having an increased solubility relative to that of said intermediate reaction product in said low boiling point organic solvent.

4,346,207

FLOWABLE, CURABLE EPOXY RESIN MIXTURE

Jürg Maurer, Riehen, and Heinz Rembold, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,856

Claims priority, application Switzerland, Aug. 11, 1980, 6059/80

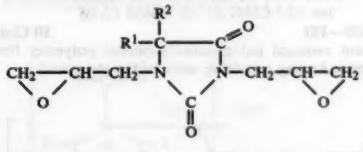
Int. Cl.³ C08G *59/26, 59/42*

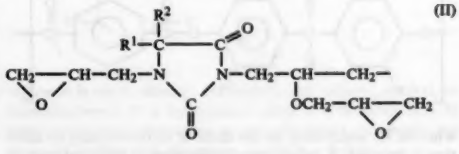
U.S. Cl. 528—103 **5 Claims**

1. A flowable, curable mixture based on bisphenol epoxy resins containing on average more than one epoxy group in the molecule, a hardener for epoxy resins and, if desired, other ingredients, said mixture comprising

(a) an anhydride hardener, and

(b) a mixture of 90 to 50% by weight of at least one bisphenol epoxy resin and 10 to 50% by weight of at least one hydantoin epoxy resin of the formula I or II


(I)


(II)

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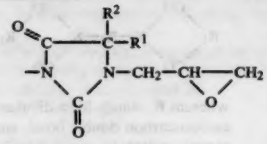


wherein R^1 and R^2 are methyl or ethyl.

4,346,208

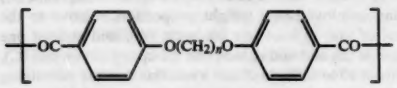
ANISOTROPIC MELTS WHICH CAN BE SHAPED, BASED ON AROMATIC POLYESTERS, AND ARTICLES FORMED FROM THESE MELTS

Bernard Fayolle, Ecully, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sep. 11, 1980, Ser. No. 186,289
Claims priority, application France, Sep. 21, 1979, 79 24135
Int. Cl.³ C08G *63/18, 63/40*
U.S. Cl. 528—176 **9 Claims**

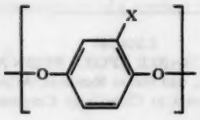
1. Anisotropic melts which can be shaped, based on aromatic polyesters, characterised in that they are prepared by fusion of a homopolyester possessing the following characteristics:

they consist essentially of repeat units of the formulae:



(I)

and



(II)

in which:

n=4 and X represents a methyl group or a chlorine atom, or

n=6 and X represents a hydrogen atom, a methyl group or a chlorine atom; and

they have flow points between 200° C. and 340° C.

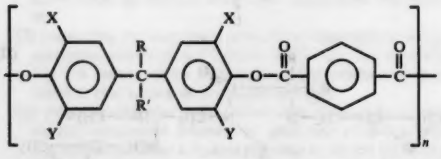
4,346,209

SOLVENT RESISTANT HALOGENATED AROMATIC POLYESTER FIBERS AND PROCESS THEREFOR

Alex S. Forschirm, Parsippany, and Arnold J. Rosenthal, Whippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,204
Int. Cl.³ C08G *63/18;* D06M *13/08*
U.S. Cl. 528—191 **10 Claims**

1. Solvent resistant halogenated aromatic polyester fibers said polyester having recurring units of the structural



wherein X, which may be the same or different, may be chlorine or bromine, Y, which may be the same or different, may be hydrogen, chlorine, or bromine, R and R′ may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and n equals at least 10, and wherein said halogenated aromatic polyester contains at least some isophthaloyl halide/bisphenol isomer of said polyester, said fibers being first heat treated at substantially constant length at a temperature of from about 270° to about 295° C. for a period of from about 5 to about 60 minutes to produce modified halogenated aromatic polyester fibers, and then further treating said modified halogenated aromatic polyester fibers with perchloroethylene which is at a temperature of from about 80° C. up to its boiling point for a period of at least about 15 minutes to produce halogenated aromatic polyester fibers having improved solvent resistance.

4,346,210

PROCESS FOR THE PREPARATION OF POLYCARBONATES CATALYZED BY CYCLIC AZA COMPOUNDS

Wolfgang Alewelt; Dieter Margotte; Claus Wulff, and Hugo Vernaleken, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 931,695, Aug. 7, 1978, abandoned. This application Oct. 26, 1979, Ser. No. 88,694
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735775
Int. Cl.³ C08L *69/00*
U.S. Cl. 528—199 **5 Claims**

1. In the process for the production of an aromatic polycarbonate by a phase boundary process the improvement comprising the introduction of a cyclic aza compound selected from the group consisting of N-ethyl pyrrolidine, N-ethylpiperidine, N-ethylmorpholine, N-isopropylpiperidine and N-isopropylmorpholine as a catalyst.

4,346,211

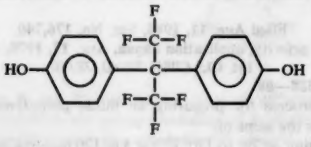
COPOLYCARBONATES PREPARED WITH 2,2′-BIS(P-HYDROXYPHENYL) 1,1,1,3,3,3-HEXAFLUOROPROPANE

Sivaram Krishnan, Moers, Fed. Rep. of Germany, and Arthur L. Baron, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 86,891, Oct. 22, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,650
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—202 **13 Claims**

1. In a polycarbonate resin based on the reaction product of a fluorine-free aromatic diol and a carbonic acid derivative the improvement comprising:

a fluorinated difunctinal phenolic compound represented by the structural formula:



co-reacted in said reaction product.

4,346,212

PHENANTHRENE/HCHO DERIVED POLYAMIDE-IMIDE

Joseph G. Robinson, Winchcombe; David I. Barnes, Cheltenham, and Angela M. Carswell, Longhope, all of England, assignors to Coal Industry (Patents) Limited, England

Filed Jul. 31, 1980, Ser. No. 174,152
Claims priority, application United Kingdom, Sep. 21, 1979, 7932778
Int. Cl.³ C08G 2/16, 73/10
U.S. Cl. 528—229 11 Claims

1. A method of producing a phenanthrene-derived poly-(amide-imide) resin comprising the steps of

(1) reacting a phenanthrene with formaldehyde or a formaldehyde donor in the presence of an acid catalyst to give a phenanthrene-formaldehyde reaction product having substantially only methylene bridges;

(2) oxidising the reaction product to oxidise the methylene bridges to keto groups and to break the 9, 10 bond in the phenanthrene moieties to produce a polycarboxylated reaction product; and

(3) reacting the polycarboxylated reaction product with an aromatic diamine to produce a poly-(amide-imide) resin.

4,346,213

PROCESS FOR THE PREPARATION OF POLYBUTYLENE TEREPHTHALATE

Henry K. Hall, Jr., and Anne B. Padias, both of Tuscon, Ariz., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 25, 1980, Ser. No. 181,275
Int. Cl.³ C08G 63/34
U.S. Cl. 528—272 13 Claims

1. In the process for preparing polybutylene terephthalate in which terephthalic acid and 1,4-butanediol are reacted in a first stage at elevated temperature in the presence of polyesterification catalyst until the clearing point of the reaction is reached, and the reaction products of the aforesaid first stage are further reacted in a second stage at a temperature which is higher than that of the first stage and at substantially less than superatmospheric pressure to distill 1,4-butanediol, in the presence of polycondensation catalyst to provide polybutylene terephthalate, the improvement is provided which comprises commencing the second stage reaction after a major part of the terephthalic acid has been consumed in the first stage but before the clearing point of the first stage reaction has been reached.

4,346,214

PROCESS FOR THE PRODUCTION OF POLYESTER AMIDE SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 124,093, Feb. 25, 1980, which is a continuation-in-part of Ser. No. 10,061, Feb. 7, 1979, Pat. No. 4,200,697, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Aug. 31, 1981, Ser. No. 297,715
Int. Cl.³ C08G 63/04, 63/30
U.S. Cl. 528—275 10 Claims

1. The process for the production of polyester amide silicate resinous product by the following steps:

(a) mixing 1 to 10 parts by weight of an oxidated silicon compound, 1 to 30 parts by weight of a polyhydroxy organic compound, 10 to 30 parts by weight of a polycarboxylic acid and/or polycarboxylic acid anhydride compound, 1 to 30 parts by weight of an organic polyamine compound and up to 10% by weight of an alkali catalyst, percentage based on the weight of the reactants.

(b) heating the said mixture at a temperature between the melting and the boiling temperatures of the polycarboxylic acid or polycarboxylic acid anhydride or polyamine compound while agitating for 20 to 90 minutes, thereby

(c) producing a polyester amide silicate resinous product.

4,346,215

FILM OF AROMATIC POLYAMIDE AND PROCESS THEREFOR

William D. Garlington, and Isadore Swerlick, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 130,851, Mar. 17, 1980, abandoned. This application Jul. 17, 1981, Ser. No. 284,235
Int. Cl.³ C08G 69/32, 69/46
U.S. Cl. 528—348 5 Claims

1. A film of wholly aromatic polyamide, at least 85% of the repeating units of which are metaphenylene isophthalamide units, said polyamide having an inherent viscosity of at least 1.2 deciliters/g in concentrated sulfuric acid at 30° C. at a concentration of 0.5 gram of polymer per 100 cc of solution and being soluble to the extent of 1 g of polyamide in a solvent consisting of 9 g of N,N-dimethylacetamide and 1 g of $CaCl_2.2H_2O$ at 25° C., said film being transparent, undrawn, and noncrystalline and having a pneumatic impact strength of at least 2 kg-cm/mil.

4,346,216

OSMIUM CARBOHYDRATE COMPLEXES

Conrad C. Hinckley, Carbondale, Ill., assignor to Research Corporation, New York, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,163
Int. Cl.³ C07H 23/00
U.S. Cl. 536—121 6 Claims

1. A complex comprising a polydisperse mixture of osmium-carbohydrate polymers prepared by reacting an osmium compound with a carbohydrate selected from the group consisting of aldoses, ketoses, heptuloses, octuloses, nonuloses, uronic acids, aldonic acids, alditols, disaccharides and polysaccharides.

2. The complex of claim 1 wherein said carbohydrate is glucose.

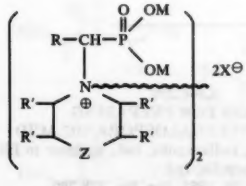
4,346,217

DI-QUATERNARY AMMONIUM SALTS OF α-1,4-THIAZINE ALKANEPHOSPHONIC ACIDS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 932,259, Aug. 9, 1978, Pat. No. 4,264,768. This application Oct. 14, 1980, Ser. No. 196,984
Int. Cl.³ C07D 279/12
U.S. Cl. 542—412 11 Claims

1. A compound of the formula



where R is alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl, or hydroxyphenyl, R′ is hydrogen or alkyl, Z is S, SO or SO_2, M is hydrogen or a salt moiety, ~~~ is a bridging group selected from alkenylene and alkinylene, and X is a halide.

4,346,218

CYCLIZATION PROCESS TO FORM CEPHEM RING

Teruji Tsuji, Takatsuki; Yoshio Hamashima, Kyoto; Mitsuru Yoshioka, Toyonaka; Masayuki Narisada, Ibaraki; Hiroshi Tanida; Taichiro Komeno, both of Osaka, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 66,462, Aug. 13, 1979, abandoned, which is a continuation of Ser. No. 856,807, Dec. 1, 1977, abandoned, which is a division of Ser. No. 658,665, Feb. 17, 1976, Pat. No. 4,079,181. This application Feb. 27, 1980, Ser. No. 125,233

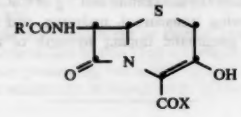
Claims priority, application Japan, Feb. 17, 1975, 50/19612; Feb. 21, 1975, 50/22229; Mar. 7, 1975, 50/28452; Mar. 30, 1975, 50/33808

The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.

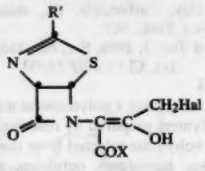
Int. Cl.³ C07D *501/20*

U.S. Cl. 544—16 4 Claims

1. A method for the production of a compound of the formula



which comprises treating a compound of the formula



with an acid, base, solvent, or solvent together with a catalizer selected from the group of a neutral or basic silica gel, alumina, diatomaceous earth, or florisil, wherein

R′ is a member selected from the group consisting of (1) hydrogen, (2) C_1 to C_4 alkyl, (3) phenyl, (4) α-chlorobenzyl, (5) ArCQQ, (6) Ar—G—CQQ wherein Q represents hydrogen or methyl, G represents oxygen or sulfur and Ar represents (a) phenyl, (b) dihydrophenyl, (c) monocyclic heterocyclic aromatic containing from 1 to 4 hetero atoms selected from the group of nitrogen, oxygen and sulfur or (d) one of said groups (a) to (c) substituted by an inert group selected from the group of alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, chlorine, bromine, iodine, fluorine, trifluoromethyl hydroxy, cyano, aminomethyl, amino and nitro,

Hal is chlorine, bromine, or iodine, and

X is OH or a carboxy protecting group.

4,346,219

PROCESS FOR PREPARING DESACETOXYCEPHALOSPORANIC ACID

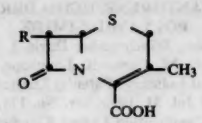
William C. Vladuchick, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 29, 1981, Ser. No. 278,780

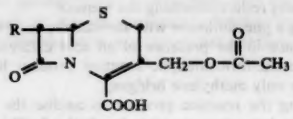
Int. Cl.³ C07D *501/04*

U.S. Cl. 544—28 10 Claims

1. A process for preparing a desacetoxycephalosporanic acid of the formula



which comprises mixing at a temperature between about 20° C. and about 100° C. a cephalosporanic acid of the formula



with a tri(C_1–C_6 alkyl)silane in the presence of an organic acid having a pKa of less than 1.5 and a Lewis acid; wherein R is amino or disubstituted amino.

4,346,220

1,2,4-TRIAZIN-5-ONES

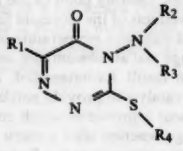
Maged M. Fawzi, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 597,836, Nov. 28, 1966, Pat. No. 3,905,801. This application Nov. 22, 1974, Ser. No. 526,261

Int. Cl.³ C07D *253/06;* A01N *43/64*

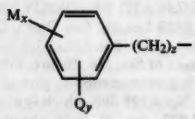
U.S. Cl. 544—182 6 Claims

1. Substituted 1,2,4-triazine-5-one having the formula



wherein

R_1 is hydrogen, alkyl of 1 through 8 carbon atoms, naphthyl, benzyl, phenyl, or



wherein

M and Q are each separately halogen, nitro, cyano, alkyl of 1 through 3 carbon atoms, or alkoxy of 1 through 3 carbon atoms,

x and y are each integers from 0 to 2 provided that the sum of x and y is either 1 or 2, and

z is 0 or 1;

R_2 and R_3 are each separately hydrogen, alkyl of 1 through 4 carbon atoms, phenyl, or

R_2, R_3 and the nitrogen atom to which they are bonded taken together form morpholino, piperidino, or pyrrolidino; and

R_4 is hydrogen, alkyl of 1 through 4 carbons, benzyl, allyl, carboalkoxy of 2 through 4 carbon atoms, or carboalkoxy alkyl of 3 through 4 carbon atoms,

provided that when R_4 is hydrogen or methyl and R_2 and R_3 are each hydrogen, then R_1 is other than methyl or phenyl.

4,346,221

PREPARATION OF 4-AMINO-6-(PYRIDINYL)-3(2H)-PYRIDAZINONES FROM 6-(PYRIDINYL)-3(2H)-PYRIDAZINONES

George Y. Lesher, Schodack; William B. Dickinson, Albany, and Baldev Singh, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 144,563, Apr. 28, 1980, Pat. No. 4,305,943. This application Mar. 2, 1981, Ser. No. 239,566
Int. Cl.³ C07D *401/04;* A61K *31/50*
U.S. Cl. 544—238 3 Claims

1. The process which comprises reacting 2-R-6-PY-3(2H)-pyridazinone with hydrazine to produce 4-amino-2-R-6-PY-3(2H)-pyridazinone, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, and, R is hydrogen, lower-alkyl or lower-hydroxyalkyl.

4,346,222

1,3,5,5-TETRANITROHEXAHYDROPYRIMIDINE (DNNC)

Donald A. Levins, San Jose; Clifford D. Bedford, Mountain View, and Clifford L. Coon, Fremont, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Dec. 4, 1980, Ser. No. 212,816
Int. Cl.³ C07D *239/04*
U.S. Cl. 544—322 1 Claim

1. 1,3,5,5-Tetranitrohexahydropyrimidine.

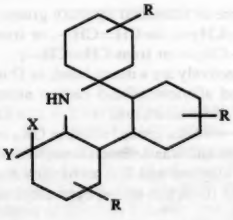
4,346,223

PREPARATION OF PERHYDROPHENANTHRIDINES

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed May 18, 1981, Ser. No. 264,900
Int. Cl.³ C07D *221/20, 221/12*
U.S. Cl. 546—18 12 Claims

1. A perhydrophenanthridine of the formula



where R is hydrogen or a hydrocarbon and X and Y are hydrogen or a hydrocarbon group substituted with a functional group selected from the group consisting of carbonyl, carboxyl or nitrilo groups.

4,346,224

4A-ARYL-DECAHYDROISOQUINOLINES

Henry Rapoport, Berkeley, Calif.; Dwight D. Weller, Champaigne, Ill., and Richard D. Gless, Oakland, Calif., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 939,706, Sep. 5, 1978, Pat. No. 4,289,882, which is a continuation-in-part of Ser. No. 900,275, Apr. 26, 1978, Pat. No. 4,189,583. This application Jan. 14, 1981, Ser. No. 224,958
Int. Cl.³ C07D *211/22, 211/60*
U.S. Cl. 546—221 3 Claims

1. The compound ethyl 4-(3'-methoxyphenyl)-2-piperidone-5-carboxylate.

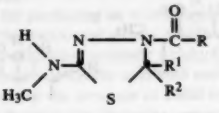
4,346,225

HERBICIDAL 2-METHYLAMINO THIADIAZOLINES

Eddie V. P. Tao, and Gilbert S. Staten, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 15, 1981, Ser. No. 273,697
Int. Cl.³ C07D *285/12*
U.S. Cl. 548—138 10 Claims

1. A compound of the formula



wherein R is phenyl, 3-trifluoromethylphenyl, 2-trifluoromethylphenyl, fluorophenyl, chlorophenyl, nitrophenyl, or C_3-C_4 alkyl; R^1 and R^2 are independently hydrogen, methyl or ethyl, provided that one of R^1 and R^2 is not methyl when the other is ethyl, and provided that no more than one of R^1 and R^2 is hydrogen.

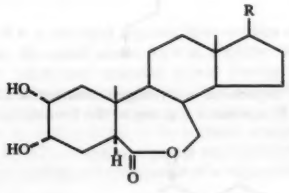
4,346,226

PLANT GROWTH PROMOTING BRASSINOSTEROIDS

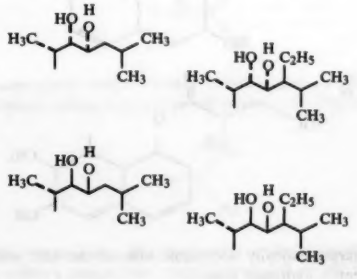
Malcolm J. Thompson, Baltimore; Nagabhushanam Mandava, Silver Spring, both of Md.; Joseph F. Worley, deceased, late of Rockville, Md. (by Anita S. Worley, a personal representative); Samson R. Dutky, Silver Spring, Md.; William E. Robbins, Silver Spring, Md., and Judith L. Flippen-Anderson, Annandale, Va., assignors to The United States of America as represented by the Secretary of the Department of Agriculture, Washington, D.C.

Filed Aug. 28, 1980, Ser. No. 182,210
Int. Cl.³ C07D *313/06*
U.S. Cl. 549—268 6 Claims

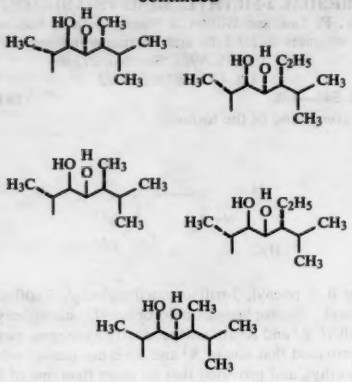
1. Polyhydroxylated steroidal lactone having from 27 to 29 carbon atoms and the formula



wherein R is selected from the group consisting of



-continued



said compounds being highly effective in promoting plant growth and increasing crop yield.

4,346,227

ML-236B DERIVATIVES AND THEIR PREPARATION

Akira Terahara, and Minoru Tanaka, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

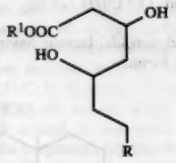
Filed Jun. 5, 1981, Ser. No. 270,846

Claims priority, application Japan, Jun. 6, 1980, 55-76127; Aug. 22, 1980, 55-115483; Sep. 8, 1980, 55-124385; Sep. 19, 1980, 55-130311

Int. Cl.³ C07C *69/013*

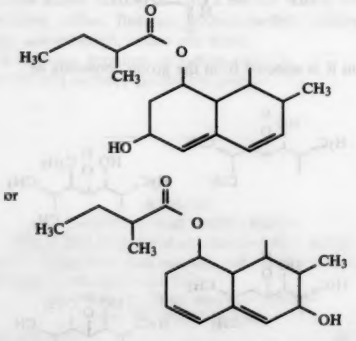
U.S. Cl. 560—119 25 Claims

1. Compounds of formula (I):



(I)

wherein R^1 represents a hydrogen atom or a C_1–C_5 alkyl group, and R represents a group of the formula



and pharmaceutically acceptable salts of the acid when R^1 represents a hydrogen atom.

4,346,228

NOVEL 11-OXOPROSTAGLANDIN DERIVATIVES

Werner Skuballa; Bernd Raduechel; Helmut Vorbrueggen; Walter Elger; Olaf Loge, and Eckehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Bergkamen, Fed. Rep. of Germany

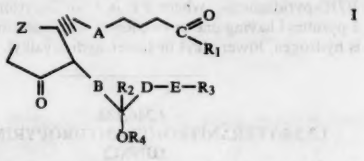
Filed Apr. 15, 1976, Ser. No. 677,420

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1975, 2517773

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—53 18 Claims

1. An 11-oxoprostaglandin acid of the formula



I

wherein

R_1 is —OR_5, —$NHSO_2CH_3$ or —O—CH_2—U—V, R_5 being a hydrogen atom, alkyl of 1–10 carbon atoms, monocyclic or bicyclic hydrocarbon aryl of 6–10 ring carbon atoms or a corresponding aryl substituted by 1–3 halogen atoms, phenyl, 1–3 alkyl groups each of 1–4 carbon atoms, chloromethyl, fluoromethyl, trifluoromethyl, carboxyl or hydroxy, or a 5- or 6-member heterocycle group attached by a ring carbon atom thereof and having at least one nitrogen, oxygen or sulfur atom as a ring member, U being a direct bond, carbonyl or carbonyloxy, and V being a phenyl ring substituted by one or more of phenyl, alkoxy or 1–2 carbon atoms, and halogen;

R_2 is a hydrogen atom or alkyl of 1–5 carbon atoms;

R_3 is alkyl of 1–5 carbon atoms, hydrocarbon alkylaryl of up to 10 carbon atoms wherein aryl is as defined hereinabove, cycloalkyl, aryl as defined hereinabove or benzodioxol-2-yl;

—OR_4 is a free or etherified hydroxy group;

A is —CH_2—CH_2—, cis-CH=CH—, or trans-CH=CH—;

B is —CH_2—CH_2— or trans-CH=CH—;

D and E collectively are a direct bond, or D is straight-chain or branched alkylene of 1–5 carbon atoms and E is an oxygen or sulfur atom; and

Z is >CH〰OR_4-group, wherein OR_4 can be in the α- or β-position and is as defined above; with the proviso that when D is alkylene and E is an oxygen atom, R_3 is alkylaryl of up to 10 carbon atoms, cycloalkyl, aryl or benzodioxolyl-2-yl;

and, when R_1 is hydroxy, physiologically acceptable salts thereof with bases.

4,346,229

REACTION PRODUCTS OF DMT PROCESS RESIDUE AND DIPROPYLENE GLYCOL

Leighton K. Derr, Aurora, Ill.; Lyle B. Hawkins, Wilmington, and Marlene J. Jones, New Castle, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed May 1, 1980, Ser. No. 145,515

Int. Cl.³ C07C *69/773, 69/76*

U.S. Cl. 560—91 2 Claims

1. The reaction product produced by reacting DMT process residue with a quantity of dipropylene glycol or a mixture thereof with up to 50% by weight of one or more different glycols, in moles, in excess of the number of equivalents of available acid and methyl ester present in said residue, as determined by the acid number and the methoxyl content of said residue.

4,346,230

PROCESS FOR THE PREPARATION OF DIMETHYL TEREPHTHALATE

Gerhart Hoffmann; Rudolph Cordes, both of Niederkassel-Ranzel, and Wolfgang Merkel, Niederkassel, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 955,538, Oct. 30, 1978, abandoned, which is a continuation of Ser. No. 790,825, Apr. 25, 1977, abandoned, which is a continuation of Ser. No. 614,971, Sep. 19, 1975, abandoned, which is a continuation of Ser. No. 316,025, Dec. 18, 1972, abandoned. This application Sep. 18, 1980, Ser. No. 188,457

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1971, 2163031

Int. Cl.³ C07C *67/08*

U.S. Cl. 560—99 9 Claims

1. In a process for the preparation of dimethyl terephthalate by the air oxidation of a mixture of p-xylene and methyl p-toluate in a liquid reaction medium at a temperature of from about 80° to 250° C., by esterification of the resulting acid products with methanol, and by recycling of the methyl p-toluate to the oxidation stage, wherein a catalyst consisting of a mixture of cobalt and manganese compounds is employed during the oxidation stage and during the esterification stage, the improvement which comprises utilizing manganese during the oxidation stage in a concentration that is less than the concentration during the esterification stage, the manganese being in a concentration ranging between 0.0005% and 0.001% by weight during the oxidation stage and in a higher concentration resulting from the addition of about 0.001 to about 1% by weight of manganese during the esterification stage and utilizing cobalt in a concentration ranging from 0.005% to 1% by weight during the oxidation stage and the esterification stage, thereby increasing the yield of dimethyl terephthalate when compared with the use of higher manganese concentrations during the oxidation stage.

4,346,231

POLYMERIZABLE ETHYL-ENICALLY UNSATURATED AMIDE COMPOUNDS

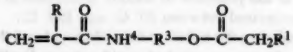
Ignazio S. Ponticello; Kenneth R. Hollister, and Richard C. Tuites, all of 1669 Lake Ave., Rochester, N.Y. 14650

Division of Ser. No. 85,138, Oct. 15, 1979, Pat. No. 4,247,673, which is a division of Ser. No. 971,463, Dec. 20, 1978, Pat. No. 4,215,195. This application Jun. 9, 1980, Ser. No. 157,600

Int. Cl.³ C07C *103/133*

U.S. Cl. 560—178 5 Claims

1. A compound of formula (II):



wherein R is hydrogen or methyl; R^1 is cyano or

wherein R^2 is alkyl of 1 to 6 carbon atoms; R^3 is alkylene of 1 to 12 carbon atoms, arylene of 6 to 12 carbon atoms, arylenebisalkylene of 8 to 32 carbon atoms, alkylenebisarylene of 13 to 34 carbon atoms, arylenealkylene of 7 to 24 carbon atoms or cycloalkylene of 4 to 12 carbon atoms; and R^4 is hydrogen or alkyl of 1 to 6 carbon atoms.

4,346,232

PROCESS FOR PRODUCING AROMATIC POLYCARBOXYLIC ACID

Makoto Komatsu; Toru Tanaka, and Hideaki Fujita, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 177,183

Claims priority, application Japan, Aug. 13, 1979, 54-103062

Int. Cl.³ C07C *51/255*

U.S. Cl. 562—416 12 Claims

1. A process for producing an aromatic polycarboxylic acid having at least three carboxyl groups, which comprises oxidizing a polyalkyl-substituted aromatic aldehyde or a polyalkyl-substituted aromatic carboxylic acid with molecular oxygen in water as a solvent in the presence of metal ions of manganese or cerium and a bromide ion-liberating compound as a catalyst, while keeping an oxygen concentration of effluent gas from reactor at least at 3%.

4,346,233

PROCESS FOR THE PREPARATION OF UREAS

Hans G. Zengel, Kleinallstadt; Manfred F. Bergfeld, and Rainer Zielke, both of Erlenbach, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

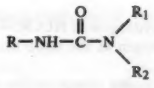
Filed Mar. 31, 1981, Ser. No. 249,536

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1980, 3015374

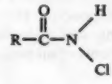
Int. Cl.³ C07C *127/15*

U.S. Cl. 562—439 3 Claims

1. A process for preparing ureas wherein no isocyanate starting materials are required, said ureas being of the formula



wherein R is a saturated aliphatic hydrocarbon radical having from 10 to 30 carbon atoms; R_1 is an aliphatic or hydroxyl- or carboxyl- substituted aliphatic radical having from 1 to 20 carbon atoms, or an araliphatic radical having from 1 to 20 carbon atoms in the aliphatic portion of the radical and having from 6 to 12 carbon atoms in the aromatic portion of the radical; and R_2 is hydrogen or a group represented by R_1; which comprises treating a N-chloramide of a higher fatty acid of the formula



in isopropanol and/or tertiary butanol, with an aliphatic or araliphatic primary or secondary amine of the formula

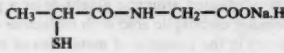
in the presence of an alkali hydroxide or alkaline-earth hydroxide within a temperature range of from 20° to 100° C.

4,346,234
PROCESS FOR THE PREPARATION OF THE SODIUM SALT OF MERCAPTOPROPIONYLGLYCINE

Pietro Gargani, Via Ripamonti, 166-Milano, Italy

Continuation-in-part of Ser. No. 45,827, Jun. 5, 1979, abandoned. This application Apr. 29, 1980, Ser. No. 145,007
Claims priority, application Italy, Jun. 16, 1978, 24637 A/78
Int. Cl.³ C07C *149/243*
U.S. Cl. 562—556 2 Claims

1. A process for preparing sodium 2-mercaptopropionylglycinate monohydrate of formula:



wherein 2-mercaptopropionylglycine is reacted with sodium 2-ethylhexanoate in an anhydrous mean, at ambient temperature and the formed salt is precipitated by cooling and addition of water.

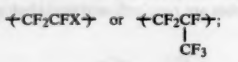
4,346,235
FLUORINE-CONTAINING COMPOUNDS

Noboru Sonoda, Osaka; Shinji Murai, Kawanishi, and Kazuhisa Takii, Nagaokakyo, all of Japan, assignors to Okamura Oil Mill Limited and Daikin Kogyo Co., Ltd., both of, Japan

Filed Jun. 10, 1980, Ser. No. 158,301
Claims priority, application Japan, Jun. 15, 1979, 54-75826; Jun. 15, 1979, 54-75827
Int. Cl.³ C07C *55/02, 53/21*
U.S. Cl. 562—596 3 Claims

1. A fluorine-containing compound of the formula

wherein A is



R_1 and R_2 are each hydrogen or $HOOC—(CH_2)_5$, while R_1 and R_2 may not be hydrogen at the same time; X is hydrogen or halogen.

3. A fluorine-containing compound as defined in claim 1 in which R_1 and R_2 are both $HOOC-(CH_2)_5$.

4,346,236
METHOD OF OXIDIZING TERTIARY-ALKYL PHOSPHINES

Fui-Tseng H. Lee, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Feb. 9, 1981, Ser. No. 232,770
Int. Cl.³ C07F *9/53*
U.S. Cl. 568—15 10 Claims

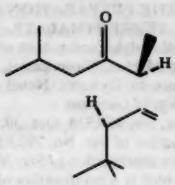
1. A process for the oxidation of a water soluble tris-alkyl phosphine to the corresponding tris-alkyl phosphine oxide which comprises heating said phosphine in the presence of water and catalytic amounts of an acid at a temperature above about 100° C.

4,346,237
BRANCHED KETONES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

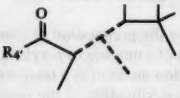
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 184,132, Sep. 4, 1980, Pat. No. 4,321,255. This application May 8, 1981, Ser. No. 261,701
Int. Cl.³ C07C *45/46, 49/203*
U.S. Cl. 568—398 7 Claims

1. The compound having the structure:



2. A product containing a major proportion of a mixture defined according to the structure:



wherein in each of the molecules of the mixture, one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond, and wherein R_4' represents C_1–C_3 lower alkyl, produced according to the process of:

(i) dimerizing 2-methyl-2-butene in the presence of an acid catalyst to produce a diisoamylene composition;

(ii) admixing the resulting dimerized isoamylene with an acylating agent selected from the group consisting of an acyl anhydride and an acyl halide in the presence of a Lewis acid catalyst or a protonic acid catalyst at a temperature of from −80° C. up to +80° C.; and

(iii) distilling the resulting product from the reaction mass.

4,346,238
PROCESS FOR THE PREPARATION OF CRYSTALLINE SODIUM PARAFORMYLPHENOLATE

Alain Schouteeten, Ezanville, and Yani Christidis, Paris, both of France, assignors to Societe Francaise Hoechst, France

Filed May 7, 1980, Ser. No. 147,678
Claims priority, application France, May 14, 1979, 79 12173
Int. Cl.³ C07C *45/54, 47/565*
U.S. Cl. 568—432 9 Claims

1. Process for manufacturing crystalline sodium paraformylphenolate comprising:

(a) condensing glyoxylic acid with an excess of phenol in water in the presence of sodium hydroxide at a temperature comprised between 30° C. and 100° C.;

(b) neutralising the solution thus obtained and then freeing it from the unconverted phenol by steam distillation or by extraction with a water-immiscible organic solvent, and then subjecting it hot under a pressure of oxygen, to a catalytic decarboxylating oxidising degradation in the presence of sodium hydroxide;

(c) allowing the aqueous solution so-obtained, after removal of the catalyst by filtration, and then concentration hot under vacuum to 60% plus or minus 10% of its initial volume, to crystallise; and

(d) draining the precipitated crystals, washing them and then drying them to constant weight under vacuum of 1 mm of mercury at about 20° C. to obtain sodium paraformylphenolate crystallised with two molecules of water.

4,346,239

PROCESS FOR THE PREPARATION OF 2-METHYLENE ALDEHYDES

Hanswilhelm Bach, Duisburg; Eike Brundin, Dinslaken, and Wilhelm Gick, Duisburg-Baerl, all of Fed. Rep. of Germany, assignors to Ruhrchemie AG, Oberhausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 106,211, Dec. 21, 1979. This application Dec. 29, 1980, Ser. No. 220,382

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025350

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

Int. Cl.³ C07C *47/22*

U.S. Cl. 568—461 15 Claims

1. A process for the preparation of a 2-methylene aldehyde which comprises contacting formaldehyde and an aldehyde of the formula $R—CH_2—CHO$, wherein R represents a substituted or unsubstituted organic radical having 2 to 12 carbon atoms in the presence of a secondary amine and an organic carboxylic acid having up to 5 carbon atoms, said secondary amine and said organic carboxylic acid being present in a catalytic amount.

4,346,240

HYDROGENATION OF ESTERS USING ALKALI DOPED HETEROGENEOUS GROUP VIII TRANSITION METAL CATALYSTS

Roger A. Grey, Denville, and Guido P. Pez, Boonton, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 132,917, Mar. 24, 1980, abandoned. This application Sep. 29, 1981, Ser. No. 307,031

Int. Cl.³ C07C *31/38*

U.S. Cl. 568—842 32 Claims

1. A process for hydrogenating a monoester to the alcohols corresponding to the acid and alcohol portions of the monoester which comprises reacting hydrogen with the monoester in the liquid phase in the presence of solid catalyst composition at a temperature not exceeding about 150° C., said solid catalyst composition consisting essentially of about 0.1 to about 15 weight percent of at least one group VIII transition metal, about 1 to about 50 weight percent of at least one alkali metal cation, about 2 to about 50 weight percent of an anion radical selected from the group consisting of arene radical anions, ketyls, aliphatic alkoxide anions and mixtures thereof, and the balance of a support comprising high surface area carbon.

4,346,241

PROCESS FOR RECOVERING ETHANOL FROM DILUTE AQUEOUS SOLUTIONS EMPLOYING LIQUID EXTRACTION MEDIA

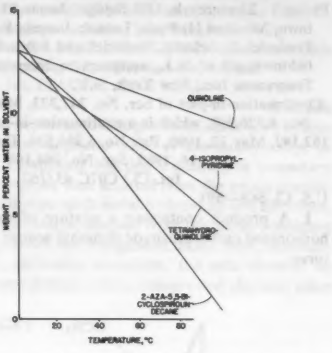
Julian Feldman, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 305,884

Int. Cl.³ C07C *29/86*

U.S. Cl. 568—916 15 Claims

1. A process for recovering ethanol present in dilute aqueous solution which comprises contacting said dilute aqueous ethanol solution with at least one inert extractant which is liquid at ambient temperature and pressure, said extractant being selected from the group consisting of unsubstituted and substituted cyclic secondary amines and unsubstituted and substituted aromatic cyclic amines having a distribution coefficient of at least about 0.70.



4,346,242

METHOD FOR PREPARING SUBSTITUTED META-PHENYLALKOXYNITROBENZENES

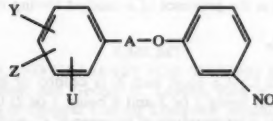
David M. Spatz, San Francisco, Calif., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 5, 1980, Ser. No. 156,881

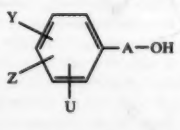
Int. Cl.³ C07L *41/01*

U.S. Cl. 568—586 9 Claims

1. A method for the preparation of compounds of formula:



wherein Y is hydrogen, halogen, C_1–C_4 alkyl, C_3–C_5 alkenyl, C_3–C_5 alkynyl, C_1–C_4 alkoxy, CH_3S, CF_3, CN, NH_2, OCF_2H, OCF_3 or OCF_2Cl; Z is hyrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, or CF_3; U is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; A is C_2–C_4 alkylene, straight chain or branched; comprising reacting a compound of formula:



wherein Y, Z, U and A are as defined above with an equimolar amount of m-dinitrobenzene in the presence of an equimolar amount of an alkali metal hydroxide or an alkali metal alkoxide and in the presence of a polar solvent of hexamethylphosphoramide, dimethylformamide, dimethyl sulfoxide, acetonitrile or mixtures thereof in the temperature range of from 20° C. to 80° C.

4,346,243

METHYL SUBSTITUTED NORBORNANE CARBOXALDEHYDE DIMETHYL ACETALS

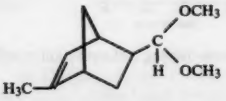
Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Rumson; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 247,323, Mar. 25, 1981, Pat. No. 4,326,998, which is a continuation-in-part of Ser. No. 152,187, May 22, 1980, Pat. No. 4,284,824. This application Jul. 16, 1981, Ser. No. 284,108

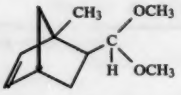
Int. Cl.[3] C07C *43/162*

U.S. Cl. 568—591 1 Claim

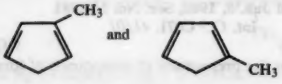
1. A product containing a mixture of methyl substituted norbornane carboxaldehyde dimethyl acetals having the structures:



and



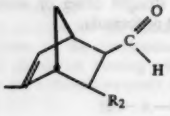
produced according to the process which consists of the steps of (i) admixing a mixture of methyl cyclopentadienes having the structures:



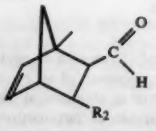
with acrolein in the presence of a catalyst having the formula:

$$R_{m'}AlX_n$$

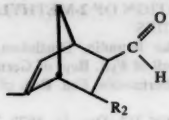
wherein R' is C_1–C_3 alkyl and X is chloro or bromo with m+n=3 and m being 1 or 2 and n being 1 or 2; the reaction taking place at a temperature of between 0° C. and 50° C.; the reaction taking place in the presence of an inert solvent wherein a mixture of compounds having the structures:



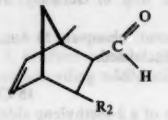
and



is formed; (ii) reacting the mixture of compounds having the two structures:



and



with methyl alcohol in the presence of an alkali metal alkoxide; and (iii) distilling the resulting reaction product from the reaction mass; wherein R_2 is hydrogen.

4,346,244

PREPARATION OF CHLOROALKOXYBENZENES

Gerard Soula, Meyzieu, and Louis Linguenheld, Ruelisheim, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 11, 1981, Ser. No. 242,540

Claims priority, application France, Mar. 12, 1980, 80 05489

Int. Cl.[3] C07C *41/16*

U.S. Cl. 568—656 20 Claims

1. A process for the preparation of a chloroalkoxybenzene, comprising reacting a polychlorobenzene having the structural formula (I):

(I)

wherein n ranges from 2 to 6, with at least one alkali metal hydroxide and alcohol having the formula ROH (II), wherein R contains from 1 to about 12 carbon atoms, in the presence of an effective amount of at least one tertiary amine sequestering agent having the formula (III):

$$N\text{-}[CHR_1\text{—}CHR_2O\text{—}(CHR_3\text{—}CHR_4\text{—}O)_nR_5]_3 \quad \text{(III)}$$

wherein n is a number greater than or equal to 0 and less than or equal to about 10, R_1, R_2, R_3, R_4, which may be identical or different, each represents a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms and R_5 represents an alkyl or cycloalkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical of the formula $-C_mH_{2m}\text{-}\phi$, or $C_mH_{2m+1}\text{-}\phi$-, with m ranging from 1 to about 12 and ϕ being phenyl.

4,346,245

SUBSTITUTED TRICYCLODECANE DERIVATIVES

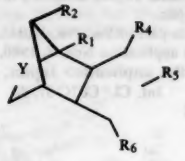
Mark A. Sprecker, Sea Bright, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 220,628, Dec. 29, 1980, which is a division of Ser. No. 144,898, Apr. 29, 1980, Pat. No. 4,275,251. This application Sep. 25, 1981, Ser. No. 305,531

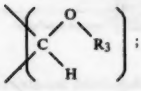
Int. Cl.[3] C07C *43/162*

U.S. Cl. 568—665 2 Claims

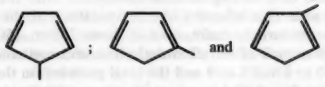
1. A product comprising a major proportion of at least one compound defined according to the structure:



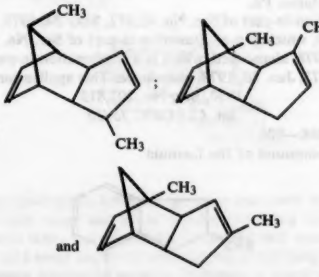
wherein Y is the moiety having the structure:



wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents a carbon-carbon double bond; wherein R_1 and R_2 represent hydrogen or methyl with the proviso that one of R_1 or R_2 is hydrogen and the other of R_1 and R_2 is methyl; wherein R_4, R_5 and R_6 represent hydrogen or methyl with the proviso that one of R_4, R_5 and R_6 is hydrogen; and wherein R_3 is isopropyl; produced by the process comprising the step of reacting in the presence of a protonic acid catalyst or a Lewis acid catalyst at least one methyl cyclopentadiene isomer having a structure selected from the group consisting of:



or at least one precursor thereof having a structure selected from the group consisting of:



with isopropyl alcohol in the presence of a Lewis acid catalyst selected from the group consisting of borontrifluoride, borontrifluoride etherate, zinc chloride and stannic chloride or a protonic acid catalyst selected from the group consisting of sulfuric acid, para toluene sulfonic acid and phosphoric acid at a temperature in the range of from 25° C. up to 125° C.

4,346,246

PROCESS FOR ADJUSTING THE HALOGEN CONTENT OF HALOGENATED ALIPHATIC ETHERS

Ross C. Terrell, Clark, and Kirsten Hansen, Berkeley Heights, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 19,953, Mar. 12, 1979, abandoned. This application May 13, 1980, Ser. No. 149,360

Int. Cl.³ C07C *41/01, 41/24*

U.S. Cl. 568—684 **9 Claims**

1. A process for replacing a halogen substituent with hydrogen in a halogenated aliphatic ether of the methyl-ethyl or ethyl-ethyl type, comprising reacting a primary or secondary alkanol and an inorganic base selected from the group consisting of alkali and alkaline earth metal hydroxides and alkoxides, in the presence of a catalyst selected from the group consisting of copper, silver, cobalt, tin, manganese, nickel, iron, molybdenum, chromium, antimony, vanadium, the salts thereof, an amine, and mixtures thereof, with a halogenated aliphatic ether of the formula:

(a) $CX_3OCY_2CZ_3$

where

CX_3 is CF_3, CH_3, CH_2F, CF_2Cl, CF_2Br, or CHF_2;

and

CZ_3CY_2 is CF_3CCl_2, CF_3CClBr, CF_3CBr_2, $CFCl_2CF_2$, $CFCl_2CFCl$, $CFCl_2CFBr$, $CFBrClCF_2$, $CFClBrCFCl$, $CFBrClCFBr$, CCl_3CF_2, $CFBr_2CF_2$, $CFBr_2CFCl$, $CFBr_2CFBr$, CCl_2BrCF_2, $CClBr_2CF_2$ or CBr_3CF_2, or

(b) $CX_3CY_2OCY_2CX_3$

where at least one of the CX_3CY_2 groups is selected from the following:

CF_3CCl_2, CF_3CClBr, CF_3CBr_2, $CFCl_2CF_2$, $CFCl_2CFCl$, $CFCl_2CFBr$, $CFBrClCF_2$, $CFBrClCFCl$, $CFBrClCFBr$, CCl_3CF_2, $CFBr_2CF_2$, $CFBr_2CFCl$, $CFBr_2CFBr$, CCl_2BrCF_2, $CClBr_2CF_2$ or CBr_3CF_2;

and the other CX_3CY_2 group may be the same or may be selected from the following:

CF_3CH_2, CF_3CHF, CF_3CHCl, CF_3CHBr, CF_3CF_2, CF_3CFCl, CF_3CFBr, CH_3CH_2, $CHFCH_2$, CHF_2CF_2, $CFClCF_2$, $CF_2ClCFCl$, $CF_2ClCFBr$, CF_2BrCF_2, $CF_2BrCFCl$, $CF_2BrCFBr$, $CHFBrCF_2$, $CHCl_2CF_2$, $CHClBrCF_2$, or $CHBr_2CF_2$.

4,346,247

METHOD AND CATALYST FOR MAKING BISPHENOL

Gary R. Faler, and George R. Loucks, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 103,095, Dec. 13, 1979, Pat. No. 4,294,995. This application Jul. 24, 1981, Ser. No. 286,492

The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.

Int. Cl.³ C07C *37/00*; C08F *112/08*

U.S. Cl. 568—728 **2 Claims**

1. In a method for making bisphenol, based on the reaction between a ketone and a phenol in the presence of an effective amount of a sulfonated polystyrene cation-exchange resin in acid form modified by the neutralization of 5–25% of a cation-exchange capacity with a promoter in the form of an organo mercapto amine whereby the promoter is incorporated onto the cation-exchange resin backbone by an acid-amine salt ionic bond which is susceptible to excessive loss from the cation-exchange resin due to leaching as the result of the degradation of the acid-amine salt ionic bond during the use of the ion-exchange resin in phenol-ketone condensation reaction, the improvement which comprises utilizing as the cation-exchange resin, a sulfonated polystyrene having 5–25% of its cation-exchange capacity occupied by C_2–C_{14} organo mercapto amine covalently bonded to the cation-exchange backbone by nitrogen-sulfur linkages.

4,346,248

PREPARATION OF 2,4,5-TRICHLOROPHENOL AND 2,4,5-TRICHLOROPHENOXYACETIC ACID FREE OF 2,3,7,8-TETRACHLORO-DIBENZO-P-DIOXIN CONTAMINATION

Dennis L. Deavenport, Memphis, Tenn.; Kenneth J. Howard, North Little Rock, and Albert E. Sidwell, Jacksonville, both of Ark., assignors to Vertac Chemical Corporation, Memphis, Tenn.

Continuation of Ser. No. 122,838, Feb. 20, 1980, abandoned. This application May 22, 1981, Ser. No. 266,479

Int. Cl.³ C07C *39/32*

U.S. Cl. 568—776 3 Claims

1. A process for the production of 2,4,5-trichlorophenol analytically free of 2,3,7,8-tetrachloro-dibenzo-p-dioxin consisting essentially of nitrating 1,2,4-trichlorobenzene with an acid selected from the group consisting of:

(a) fuming nitric acid at a temperature of from 30° C. to 55° C.,

(b) mixed concentrated sulfuric acid/concentrated nitric acid at a temperature of from 60° C. to 100° C. and

(c) concentrated sulfuric acid at a temperature of from 50° C. to 100° C., followed by concentrated nitric acid at the same temperatures,

reducing the resulting 1,2,4-trichloro-5-nitrobenzene by a process selected from the group consisting of catalytic hydrogenation and in situ hydrogenation by the action of an acid on a metal with formation of nascent hydrogen, acidifying the resulting 2,4,5-trichloroaniline with a strong mineral acid, diazotizing the resulting strong mineral acid salt of 2,4,5-trichloroaniline, in the presence of an alkali metal nitrite suspended in a cold aqueous strong mineral acid solution at a temperature below 10° C., hydrolytically decomposing the resulting 2,4,5-trichlorobenzenediazonium acid salt, in the presence of water or steam at a temperature of from reflux temperature to 375° C. and recovering 2,4,5-trichlorophenol analytically free of 2,3,7,8-tetrachloro-dibenzo-p-dioxin in an analytical test sensitive to 100 parts per billion.

4,346,249

PREPARATION OF PARA-ISOPROPENYLPHENOL

Herman O. Krabbenhoft, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. ?, 1981, Ser. No. 252,653

Int. Cl.³ C07C *37/00, 39/06*

U.S. Cl. 568—782 3 Claims

1. The process for making p-isopropenylphenol which comprises passing p-isopropylphenol, in combination with phenol and water, over a calcium-nickel-phosphate catalyst bed at a temperature of 275°–500° C., wherein the calcium-nickel-phosphate catalyst is calcined at a temperature of from 600°–800° C. prior to its use as the catalyst in the reaction, there being employed for each mol of the p-isopropylphenol, from 0.5 to 5 mols of phenol and 0.5 to 4 mols of water.

4,346,250

TELOMERIZATION OF TETRAFLUOROETHYLENE

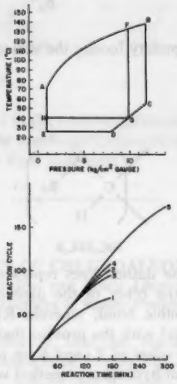
Takaomi Satokawa; Tuneo Fujii; Akira Ohmori, and Yorio Fujita, all of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 31,843, Apr. 20, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,453

Claims priority, application Japan, Apr. 21, 1978

Int. Cl.³ C07C *31/38*

U.S. Cl. 568—842 7 Claims



1. A process for preparing by telomerization a fluoroalkanol which is predominantly of the formula

$$H(CF_2CF_2)_nCH_2OH$$

wherein n is an integer of not more than 4, said process comprising mixing substantially the total amount of methanol and polymerization initiator required for the telomerization together and then mixing tetrafluoroethylene with the resulting mixture at a rate whereby the temperature of the resulting reaction mixture is maintained at from 25° to 150° C., the partial pressures of tetrafluoroethylene and methanol are between 30 to 1 and 1 to 5 and the total pressure on the reaction is between 1 and 12 kg per cm^2 gauge until telomerization is completed.

4,346,251

4-SUBSTITUTED-2-INDANOLS

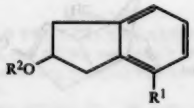
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 42,372, May 24, 1979, Pat. No. 4,263,319, which is a continuation-in-part of Ser. No. 927,198, Jul. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 870,973, Jan. 20, 1978, abandoned. This application Oct. 31, 1980, Ser. No. 202,813

Int. Cl.³ C07C *35/32*

U.S. Cl. 568—808 2 Claims

1. A compound of the formula



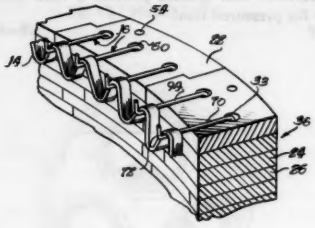
in which R^1 is phenyl which may be substituted with halogen or lower alkyl, and R^2 is hydrogen.

4,346,252

SOFT WALL HANGER FOR FURNACE

Robert R. Walton, and Finis E. Edwards, both of Shelbyville, Ind., assignors to Wellman Thermal Systems Corporation, Shelbyville, Ind.

Filed Sep. 29, 1980, Ser. No. 191,952
Int. Cl.³ F27D 1/00
U.S. Cl. 373—130 26 Claims



1. In an electrical resistance heating furnace, the combination comprising;

an outer wall for the furnace, a vertically extending lining on the interior side of said outer wall to limit heat transfer to the outer wall,

a plurality of softwall batts of ceramic fiber stacked vertically and defining a substantial portion of said lining,

a plurality of layers of insulating material more rigid than said soft wall batts of substantially the same size and shape as said soft wall batts, stacked on the top of a plurality of soft wall batts at predetermined vertical locations in said lining, and

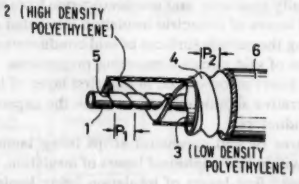
hanger means releasably connected to and supported by said layers of more rigid insulating material and having portions extending inwardly from an inner face of the lining to support electrical resistance heating elements thereon.

4,346,253

COAXIAL CABLE

Yasunori Saito; Kunihiro Nakagaki; Kunihiko Yoneyama, all of Yokohama, and Katsumi Ohmoto, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 6, 1980, Ser. No. 204,723
Claims priority, application Japan, Nov. 29, 1979, 54-166049[U]; Dec. 7, 1979, 54-170400[U]
Int. Cl.³ H01B 11/18
U.S. Cl. 174—29 3 Claims



1. A coaxial cable, comprising: inner and outer conductors, each of said inner and outer conductors being formed as a corrugated tube, and means for insulating and coaxially supporting said inner and outer conductors comprising a thermoplastic resin insulating member including a spiral rib and an insulating tube surrounding said rib, said spiral rib and said insulating tube being coupled together as an integral insulating member, said rib being in direct contact with said inner conductor and being closely fitted in bottoms of the corrugated portions thereof, said coaxial cable further comprising means for improving the bendability of the cable including spirally corrugated said inner and outer conductors with pitches P_1 and P_2, respectively, the ratio of said pitch P_1 to said pitch P_2 being in a range from 0.9 to 1.2, and said spiral rib being formed with a pitch P_3 wherein

$$P_1 \simeq P_2 \simeq P_3/N,$$

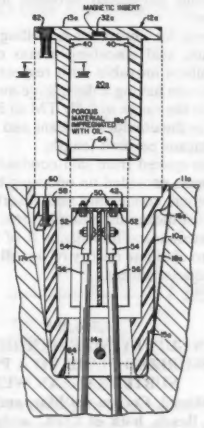
where N is an integer.

4,346,254

TEST STATION APPARATUS FOR FLUSH MOUNTING

Frank W. Borin, 2552 Almaden Ct., Bel Air, Calif. 90024, and Jeffrey G. Thomas, 17800 Rayen, Northridge, Calif. 91423

Continuation-in-part of Ser. No. 19,989, Mar. 12, 1979, abandoned. This application May 2, 1980, Ser. No. 145,941
Int. Cl.³ H02G 9/10
U.S. Cl. 174—37 19 Claims



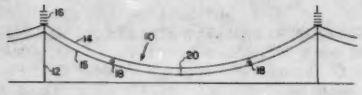
1. A cathodic test station apparatus for coupling conductor wires extending from a pipe, a casing, an anode, the soil or the like to a device to measure, supply or respond to an electrical current or potential comprising stiff conductor leads having a high resistance to bending, a generally hollow housing having a flanged upper end for extending essentially flush with the ground surface for access from aboveground after subterranean implantation of the side wall thereof such that the lower end extends into the ground and protectively surrounds end portions of said conductor leads within the housing, an enclosure member defining an airtight pocket within side wall means projecting from a solid end wall and having a flange extending outwardly therefrom for recessed support by the flanged upper end of said housing, said enclosure member having a one-piece construction to loosely fit within said housing and unsupported by the side wall thereof, a terminal block member including a terminal carrier plate, and fasteners to hold said conductor leads on said terminal carrier plate, said terminal block member being supported essentially only by said stiff conductor leads to remain in said hollow housing for access to the conductor leads from aboveground without withdrawing the terminal block member from said housing, said terminal block member having a configuration to hold the conductor leads within the airtight pocket of said enclosure member such that the airtight pocket of the enclosure member when supported by said housing prevents ingress of water into the enclosure member by entrapped air therein.

4,346,255

OVERHEAD ELECTRICAL CONDUCTOR SYSTEM INCLUDING SUBSPAN OSCILLATION AND AEOLIAN VIBRATION ABSORBER FOR SINGLE AND BUNDLE CONDUCTORS

Olaf Nigol, Etobicoke, Canada, assignor to Slater Steel Industries Limited, Hamilton, Canada

Filed May 7, 1980, Ser. No. 147,096
Claims priority, application Canada, Jan. 24, 1980, 344328
Int. Cl.³ H02G 7/14, 7/12
U.S. Cl. 174—42 9 Claims



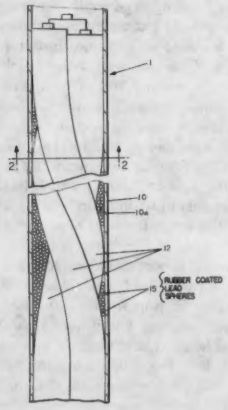
1. An overhead electrical conductor system comprising:
tower means for suspending conductor means;
conductor means suspended between intermittently spaced tower means;
absorbing means for absorbing travelling waves in said conductor means, said absorbing means comprising first and second members movable with respect to each other, said absorbing means having a dissipative mechanical impedance of value R in the range of $0.5\sqrt{TM}$ to $3.0\sqrt{TM}$, where T is the tension in the conductor means and M is the mass of the conductor means per unit length;
platform means spaced from said conductor means; and
attachment means provided on opposing ends of said first and second members connecting said absorbing means between said conductor means and said platform means, wherein said dissipative mechanical impedance R of the absorbing means is effective to dissipate energy of travelling waves generated on said conductor means.

4,346,256

CONDUIT IN SUPPLYING ELECTRICAL POWER AND PRESSURIZED FLUID TO A POINT IN A SUBTERRANEAN WELL

Martin G. Hubbard, Corona del Mar, and John W. Erickson, Huntington Beach, both of Calif., assignors to Kobe, Inc., Commerce, Calif.

Filed Apr. 1, 1980, Ser. No. 136,190
Int. Cl.³ E21B 17/00
U.S. Cl. 174—47 2 Claims



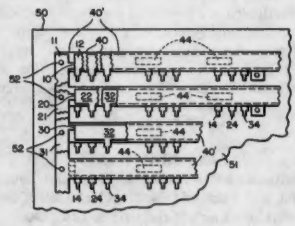
1. A conduit for concurrently transmitting electric power and pressured fluid to a utilization point within a subterranean well, comprising: a continuous cylindrical housing of sufficient length to extend from a well surface to a downhole utilization point; at least one insulated, electrically conductive wire passing through said housing; a plurality of spheres having a compressible surface packed into the space between said insulated, electric conductive wire and the interior bore of said cylindrical housing, whereby said insulated, electrically conductive wire is gravitationally stabilized within said housing and the spaces between said spheres provide a fluid passage therethrough for pressured fluid.

4,346,257

LAMINATED BUS BAR WITH DIELECTRIC CERAMIC INSERTS

Lee C. Moss; Phillip J. Knox, and Raymond W. Snyder, all of Rochester, N.Y., assignors to Eldre Components, Inc., Rochester, N.Y.

Filed Mar. 18, 1980, Ser. No. 131,523
Int. Cl.³ H01B 5/00
U.S. Cl. 174—72 B 7 Claims

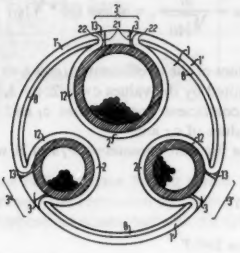


1. A laminated bus bar comprising
a pair of flat, metal, strip conductors, each having a plurality of circuit-connecting projections extending from at least one edge thereof,
a first layer of dielectric insulation laminated between and electrically insulating said conductors one from the other,
additional layers of dielectric insulation laminated over and enclosing the outside surfaces of said conductors except in the areas of said circuit-connecting projections,
a ceramic insert incorporated in said first layer of insulation and operative significantly to increase the capacitance of said conductors,
at least three of said conductor strips being laminated together within said additional layers of insulation, and with one of said first layers of insulation being laminated between each pair of adjacent conductors,
each of said first layers of insulation having therein a plurality of longitudinally spaced openings and each of said openings having one of said inserts secured therein with opposite sides of said insert engaged with the confronting surfaces of the two conductors which flank the respective first layer of insulation, and
means connecting at least certain of the projections on one of a first pair of said conductors with certain of the projections on the other of said first pair of conductors thereby further to increase the capacitance as between said first pair of conductors and a third conductor in said bar.

4,346,258
CABLE SLEEVE SEALED AT EACH END BY END MEMBERS

Dieter Kunze, Neuried, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,550
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1979, 2947139
Int. Cl.³ H02G 15/08
U.S. Cl. 174—93 9 Claims

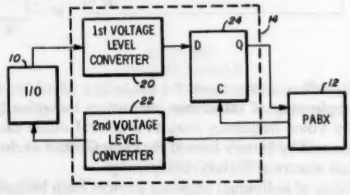


1. In a cable sleeve having a tubular member closed at each end by an end member having a substantially cylindrical flange received on a separate support member and means for forming a seal between a portion of the tubular member and the flange, each of said end portions having at least one cable inlet, each of said cable inlets being formed by a protuberance of a heat shrinkable material having an axially extending separating line which is common with the cylindrical flange to enable introduction of a cable into the inlet, the improvement comprising each of the common separating lines being an axial extending opening having non-joinable edge portions spaced apart a sufficient distance to enable easy insertion of the cable, and each of the openings receiving a separate, metal filling member having a coating of heat meltable sealing adhesive, said non-joinable edges of each opening being sealingly engaged with the filling member after the heat shrinking operation.

4,346,259
LOW SPEED TERMINAL INTERFACE FOR ALL-DIGITAL PABX

Jay Doty, Santa Ana, Calif., assignor to Anderson Jacobsen, Inc., San Jose, Calif.

Filed Jun. 23, 1980, Ser. No. 162,115
Int. Cl.³ H04J 3/02; H04B 1/16; H04L 5/22
U.S. Cl. 178—3 2 Claims



1. A data interface for the interfacing of a first I/O terminal for the conversion of alphanumeric characters to binary encoded signals with a PABX for switching and multiplexing the signals for the subsequent application to a second I/O terminal interfaced with the PABX for the conversion of the signals to alphanumeric characters, said data interface comprising:

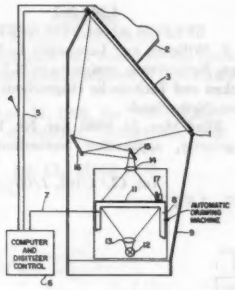
a transmission channel including, a first voltage level converter for application of binary encoded signals from said first I/O terminal, means for sampling the applied signals having a first input responsive to said first voltage converter, a second input responsive to a clock signal developed by said PABX, and an output for applying the sampled signals to said PABX; and

a reception channel including a second voltage level converter for application of received binary encoded signals from said PABX to said second I/O terminal.

4,346,260
METHOD AND APPARATUS TO CONTROL A DRAWING MACHINE ATTACHED TO A COMPUTER BY MEANS OF A DIGITIZING DEVICE

Rainer Kaufmann, Hamburg, Fed. Rep. of Germany, assignor to Aristo Graphic Systeme GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,476
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925613
Int. Cl.³ G06F 3/08; G06K 15/20
U.S. Cl. 178—18 10 Claims



1. In a method for controlling a drawing machine having a horizontal table surface and a carriage means to move a drawing head that is controlled by a computer which receives inputs from a digitizing device which further comprises a sensor plate and sensor, the improvement which comprises the steps of optically projecting an image of the horizontal drawing table surface through the back side of a translucent sensor plate which is spaced thereabove, and thereby reproducing an image of said drawing table surface conformably upon the front side of said plate as a drawing field, to thereby define a screen upon which a digitizing sensor is operable to be employed, and in turn supply inputs to said computer to control said drawing head.

4,346,261
SPEAKER PHONES

Alfred M. Hestad, and Levi L. Rose, both of Chicago, Ill., assignors to United Networks, Inc., Chicago, Ill.

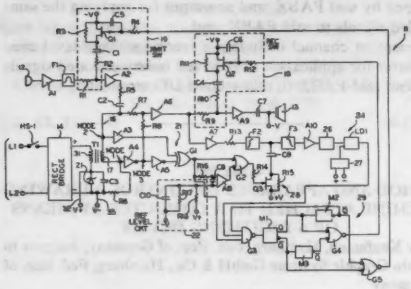
Filed Mar. 17, 1980, Ser. No. 130,847
Int. Cl.³ H04M 9/08
U.S. Cl. 179—1 HF 15 Claims

13. A system for determining speech direction in duplex circuits wherein signals occur in first and second directions,

said system including component means wherein said signals in said first direction are in phase at two separate nodes in said component, while signals in said second direction are out of phase at said two separate nodes, and

gate means having inputs connected to said first and second

nodes for providing high outputs responsive to the out-of-phase signals at the inputs to said gate means and low



outputs responsive to the in-phase signals at the inputs of said gate means.

4,346,262

SPEECH ANALYSIS SYSTEM

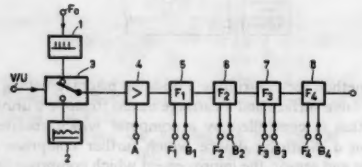
Leonardus F. Willems, and Leonardus L. M. Vogten, both of Eindhoven, Netherlands, assignors to N.V. Philips' Gloeilampenfabrieken and Technische Hogeschool Eindhoven, both of Eindhoven, Netherlands

Filed Mar. 31, 1980, Ser. No. 135,963

Claims priority, application Netherlands, Apr. 4, 1979, 7902631

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SA **1 Claim**



1. In a speech analysis system, the method of determining the formant parameters for a recursive digital all-pole filter whereby a function derived from the filter approaches, as closely as possible, a function derived from the speech, the method comprising the steps:

sampling, at a predetermined rate, segments, of a specified duration,, of the speech signal;

determining the auto-correlation coefficients r_k from the signal samples s_j, wherein:

$$r_k = \sum_{n=1}^{l} s_n \cdot s_{n+k}$$

determining the filter coefficients a_j from the autocorrelation coefficients r_k, wherein:

$$r_k = -\sum_{j=1} a_j \cdot r_{|j-k|}$$

determining the coefficient combinations p_i and q_i of the n second-order sections of the digital all-pole filter, wherein the transfer function thereof is split into n second-order transfer functions:

$$\frac{1}{1+\sum_{j=1} a_j \cdot z^{-j}} = \frac{1}{\prod_{i=1}^{n} (1 + p_i \cdot z^{-1} + q_i \cdot z^{-2})}$$

where $z^{-1}=\exp(-sT)$, s being the complex frequency $s=+jw$ and T the sampling period;

transforming the coefficient combinations p_i and q_i into the coefficients c_i and r_i in accordance with the equations:

$$c_i = \frac{p_i}{\sqrt{|q_i|}}, \quad r_i = \text{sign}(q_i) \cdot \sqrt{|q_i|}$$

limiting the values of the coefficients c_i and r_i to values located in an area limited by the values $c=-2$, $c=2$, $r=1$ and $r=0$;

arranging the coefficient combinations c_i and r_i in order of increasing values of c_i; and

determining the formant parameters F_i and B_i using the equations:

$$r_i = e^{-\pi B_i T},$$

$$C_i = -2 \cos 2\pi F_i T$$

controlling said fiter utilizing said formant parameters to generate said filter-derived speech function.

4,346,263

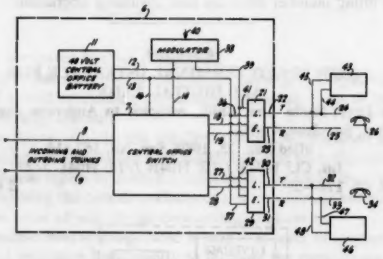
SIGNALLING ARRANGEMENT FOR TELEPHONE EQUIPMENT

C. Edward Elkins, Pleasant Hill, Calif., assignor to Badger Meter, Inc., Richmond, Calif.

Filed Jan. 14, 1980, Ser. No. 111,549

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 A **16 Claims**



1. A signalling arrangement for use with a telephone system having a plurality of subscriber telephones individually connected by voice frequency lines to a central office exchange and connected by battery lines at the central office exchange to a common electrical battery, comprising:

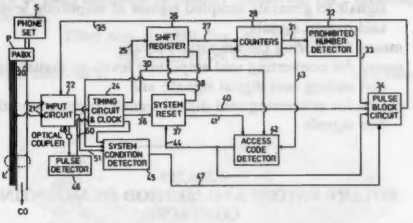
a plurality of individual response devices each located adjacent a related one of said subscriber telephones, means for connecting each of said responsive devices in circuit with the respective one of said related subscriber telephones, means for amplitude modulating said battery lines at a non audible frequency recognizable by said responsive devices, and means for connecting said modulating device through said battery lines at the central office exchange to said voice frequency lines for recognition by said responsive devices.

4,346,264

TELEPHONE CALL RESTRICTION APPARATUS

Martin M. Sharvit, Thornhill, Canada, assignor to Cindon Research Inc., Rexdale, Canada

Filed Apr. 2, 1980, Ser. No. 136,734
Int. Cl.³ H04M 1/66
U.S. Cl. 179—18 DA 18 Claims



9. A telephone call restrictor having means for authorized persons to overcome the restriction by dialing an access code on a normal telephone set connected with the system, comprising

connection means for connecting the restrictor to a telephone line;

counter means connected with said connection means for receiving dial pulse signals and for counting the pulses for digits dialed;

programmable means connected to said counter means and having prohibited number detection means connected to said counter means for recognizing a predetermined digit or combination of digits representing a prohibited number and providing at recognition an inhibit signal;

switch means responsive to the receipt of an inhibit signal for connecting a resistance across said telephone line, said resistance having a resistance value low enough to prevent dial pulses being received at a central office;

pulse detector means connected to said connection means for detecting dial pulses when said resistance is connected across said telephone line, and being connected to said counter means to provide detected dial pulse signals thereto;

a code detector connected to said counter means for recognizing a predetermined combination of digits representing an access code and providing at recognition a reset signal, and

a reset circuit responsive to said reset signal for resetting said switch means to remove said resistance and to permit dialed pulses to be received at said central office.

4,346,265

ANNUNCIATOR

Kenneth G. Buss, Dallas, and Norman L. Culp, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

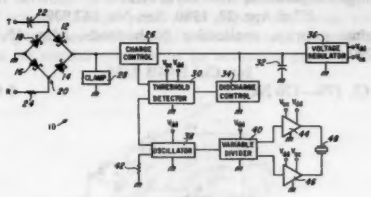
Filed Dec. 17, 1979, Ser. No. 104,332
Int. Cl.³ H04M 1/00
U.S. Cl. 179—84 T 15 Claims

1. A circuit for storing the energy of an applied signal in a charge storage device, the circuit comprising:

charge control means for resistively coupling the applied signal to the charge storage device in the absence of a charge signal, and for directly coupling the applied signal to the charge storage device in response to the charge signal;

discharge control means for resistively shunting the charge storage device in response to a discharge signal; and

threshold detecting means for providing the discharge signal when the voltage on the charge storage device is less than a first threshold, and for providing the charge signal when the



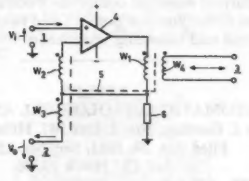
voltage on the charge storage device is at least equal to the first threshold.

4,346,266

HYBRID CIRCUIT

Klaus-Dieter K. Brockmann, and Teunis A. van Harreveld, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,305
Claims priority, application Netherlands, May 11, 1979, 7903709
Int. Cl.³ H04B 1/58
U.S. Cl. 179—170 NC 2 Claims



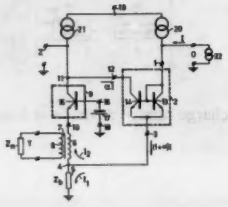
1. A hybrid circuit for coupling a two-wire port having a two-wire transmission path to a transmit port and to a receive port for the connection of the transmit path and the receive path of a four-wire transmission path to said two-wire port comprising:

a transformer having a plurality of windings, a differential amplifier, and an impedance, said receive port being connected to a first input of said differential amplifier whose output is connected at one end of a first winding of said transformer the other end of said first winding being connected to said impedance, a second input of said differential amplifier which forms a differential input in conjunction with the first input being connected to one end of a second winding of said transformer the other end of said second winding being connected to the junction of said first winding and said impedance and to one end of a third winding of said transformer, the other end of said third winding being connected to said transmit port, said two-wire port being connected to a fourth winding of said transformer, wherein the winding senses of said transformer windings are such that the voltage produced across said impedance subtracts from that induced in said third winding as a result of an input signal applied to said receive port.

4,346,267
HYBRID CIRCUIT

Eise C. Dijkmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1980, Ser. No. 142,939
Claims priority, application Netherlands, May 15, 1979, 7903797
Int. Cl.³ H04B 1/58
U.S. Cl. 179—170 NC 5 Claims



1. A hybrid circuit for coupling a two-way transmission path to a one-way transmit path and to a one-way receive path comprising:

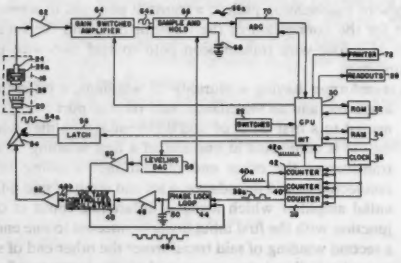
a coupling circuit,

a balancing impedance with is coupled to the two-way transmission by means of said coupling circuit, a current amplifier whose input is connected to the receive path, said hybrid circuit further comprising an impedance converter which has a high impedance output coupled to said one-way transmit path and a low-impedance input connected to one end of said coupling circuit of said balancing impedance and said two-way transmission path, the other end of said coupling circuit being connected to a terminal of common potential, said output of said current amplifier is connected to the high-ohmic output of said converter and said current amplifier comprises a common terminal connected to the junction point of said two-way transmission path and said balancing impedance.

4,346,268
AUTOMATIC AUDIOLOGICAL ANALYZER

Leonardus J. Geerling, Rte. 2, Box 947, Hillsboro, Oreg. 97123

Filed Jan. 30, 1981, Ser. No. 229,887
Int. Cl.³ H04R 29/00
U.S. Cl. 179—175.1 A 24 Claims



1. An acoustical analyzer system for testing acoustical devices comprising:

means for generating operating signals having a predetermined frequency;

means for receiving said operating signals and generating voltage signals;

means for receiving said voltage signals and generating feedback signals to said means for generating said voltage signals, said means for receiving said voltage signals generating test signals having the same frequency as the frequency of said operating signals and said feedback signals when they are in coincidence;

means for receiving said test signals and generating test tone signals having a predetermined frequency and amplitude for driving a device under test, which generates output signals;

means receiving said output signals and sampling said output signals to generate sampled signals at amplitude levels of said output signals;

means for storing the amplitude levels;

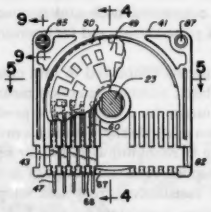
means for converting said amplitude levels to digital signals and storing said digital signals; and

means for processing said digital signals to generate utilization signals.

4,346,269
ROTARY SWITCH AND METHOD OF MOUNTING CONTACTS

Roy H. Slavin, and W. Donald Scharbert, both of Aurora, Ill., assignors to Standard Grigsby, Inc., Aurora, Ill.

Continuation of Ser. No. 781,511, Mar. 25, 1977, abandoned. This application Mar. 11, 1981, Ser. No. 242,597
Int. Cl.³ H01H 9/00, 19/54
U.S. Cl. 200—11 DA 20 Claims



1. A switch assembly comprising:

a first electrically insulative cover plate having a hole therethrough;

first means for retaining a plurality of contacts in spaced relation on said first cover plate said first retaining means including a plurality of first projections extending perpendicularly from an edge portion of said first cover plate and spaced from one another;

a second electrically insulative cover plate adapted to fit in parallel relation with said first cover plate;

second means for retaining a plurality of contacts in spaced relation on said second cover plate, said second retaining means including a plurality of second projections extending perpendicularly from an edge portion of said second cover plate and spaced from one another, said second projections being offset from said first projections so as to interfit therewith;

a plurality of longitudinally extending first electrical contacts retained by said first retaining means, each of said first contacts lying between respective first projections and engaged by the second projection interfitting therebetween;

a plurality of longitudinally extending second electrical contacts retained by said first retaining means, each of said second contacts lying between respective second projections and engaged by the first projection interfitting therebetween;

a rotor shaft rotatably and supportedly extending through said hole;

a rotor disc mounted on the rotor shaft for rotation therewith, said disc having first and second electrically conductive patterns formed on opposite sides thereof, respectively; and

means for fastening the first and second cover plates together in parallel relations with the rotor disc disposed between

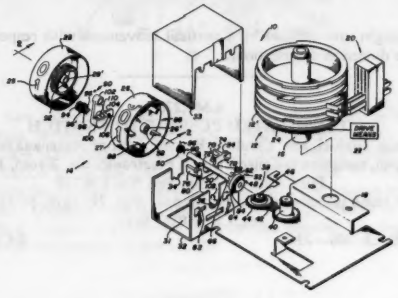
said first and second contacts so that said first contacts operatively engage said first pattern and said second contacts operatively engage said second pattern.

4,346,270

TIMING MECHANISM WITH A DIGITAL CLOCK

Garry A. Stout, Bargersville, and Donald L. Ray, Oaklandon, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Aug. 4, 1980, Ser. No. 174,756
Int. Cl.³ H01H *43/00*
U.S. Cl. 200—33 R **13 Claims**



1. In combination, a timing mechanism wherein a cam means is rotated to open and close electrical switches operably associated therewith, a digital clock means indicating cycle times of said cam means comprising:

(a) a shaft rotatably mounted in a frame,

(b) a first coupling means coupling said cam means to said shaft for rotation with said cam means,

(c) a first display wheel carried on said shaft to be independently rotatable from said shaft,

(d) actuator means including a rotating member coupled to said shaft and at least one peg extending from said rotating member,

(e) a torsion spring coupled to said actuator means and said display wheel,

(f) stop means carried on said wheel, and

(g) a slider slideably carried in said frame and engaging said one peg and said stop means to selectively stop rotation of said display wheel in response to said actuator means.

4,346,271

MANUALLY ACTUATED TIMER FOR APPLIANCES

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 6, 1980, Ser. No. 194,645
Int. Cl.³ H01H *43/12*
U.S. Cl. 200—38 R **12 Claims**

1. An electromechanical timer for use in washing appliances comprising:

a frame;

a control cam rotatably mounted to said frame and having an idle position;

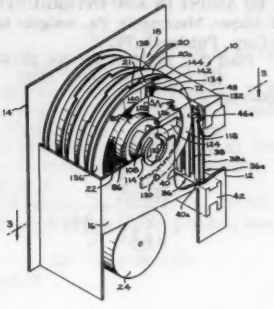
an electrically energizable motor for rotating said control cam;

control switch means for controlling energization of said motor, said switch means being operative when de-actuated to prevent energization of said motor and when actuated to enable energization of said motor; said control cam being operative in its idle position to de-actuate said switch means and in moving from its idle position to actuate said switch means;

an engaging member mounted to said frame for movement between a cocked position and a rest position and bias means urging said engaging member toward its rest position;

said engaging member being effective to move said control cam from its idle position as said engaging member moves from its cocked position to its rest position;

a manually operable actuator mounted to said frame for movement between an actuating position and a neutral position; said actuator being operative to engage and move said engaging member to its cocked position as said actuator moves from its neutral position to its actuating position and to



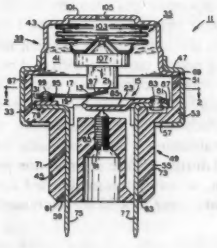
release said engaging member for movement to its rest position as said actuator moves from its actuating position to its neutral position; whereby the sequential movement of said actuator from its neutral position to its actuating position and back to its neutral position causes said control cam to move from its idle position to thereby enable energization of said motor.

4,346,272

CONTROL DEVICE AND METHOD OF OPERATING

Donald H. Stoll, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 18, 1980, Ser. No. 141,689
Int. Cl.³ H01H *35/34, 1/26*
U.S. Cl. 200—83 C **35 Claims**



2. A control device for an electrical circuit comprising:

a housing having a chamber therein;

resilient switch means pivotally mounted within said chamber and adapted for movement between circuit making and breaking positions, said switch means including means for stiffening it with said stiffening means having a force receiving portion disposed at least adjacent said switch means;

fulcrum means disposed in said chamber for pivoting engagement with said switch means; and

means in said chamber and operable generally for applying a control force onto said force receiving portion of said stiffening means, said switch means in its circuit making position being initially resiliently yieldable in response to the control force applied onto said stiffening means into the pivotal engagement with said fulcrum means and at least a part of said switch means being thereafter pivotally movable generally about said fulcrum means toward the circuit breaking

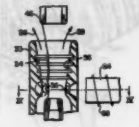
position in response to the control force applied onto said stiffening means.

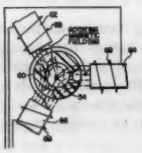
4,346,273

CIRCUIT-INTERRUPTER HAVING A HIGH-FREQUENCY TRANSVERSE MAGNETIC FIELD TO ASSIST IN ARC INTERRUPTION

Thomas N. Meyer, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1979, Ser. No. 102,045
Int. Cl.³ H01H 33/18, 33/88
U.S. Cl. 200—147 R 7 Claims





1. A puffer-type compressed-gas alternating current circuit interrupter including means defining a relatively stationary hollow venting contact structure, a relatively movable contact structure comprising a movable tubular venting arcing contact having a throat portion therethrough, a movable operating cylinder carrying said movable tubular venting arcing contact and slidable over a relatively fixed piston structure to compress gas in the confined space therebetween, means for establishing a flow of compressed gas through the throat portion of said movable tubular venting arcing contact for increased arc turbulence when the contacts are opened, means defining a hollow insulating nozzle movable with said movable tubular venting arcing contact, at least one field-coil embedded in said insulating hollow nozzle structure for generating a magnetic field transversely to the established arc, and separate power means for establishing a high-frequency current flow through said field coil during the arc-interruption period of short transitory duration, whereby the established arc is moved laterally by the Lorentz force ($J \times B$) for increased arc turbulence action.

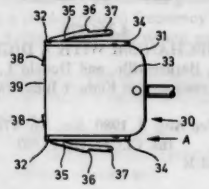
4,346,274

FASTENING DEVICE FOR A SWITCH

Erich Mutschler, and Adam Weber, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,223
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933703
Int. Cl.³ H01H 9/00
U.S. Cl. 200—296 5 Claims

1. A fastening device for a switch in a receptacle with at least two guide grooves, of which each has a bottom and two opposite lateral walls and comprises at least two guide webs which for mounting the switch on the receptacle are pushed into the guide grooves, wherein in longitudinal direction of the groove on each guide groove the one side wall is staggered backwards relative to the other side wall in such a way that the projecting portion of the longer side walls and the guide webs may be



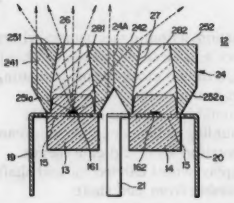
brought into contact by a vertical movement with respect to the direction of insertion.

4,346,275

ILLUMINATED PUSHBUTTON SWITCH

Norio Iwakiri, and Yasuhiro Kiyono, both of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 11, 1980, Ser. No. 176,759
Claims priority, application Japan, Aug. 21, 1979, 54-115409
Int. Cl.³ H01H 9/16
U.S. Cl. 200—314 5 Claims



1. An illuminated pushbutton switch including an elongated housing, a switching component accomodated within said housing, an actuating component coaxially housed in said housing for actuating said switching component in response to an external force, and an illuminating component for lightning an upper portion of said actuating component,

said illuminating component comprising a lead frame,

a plurality of light emitting devices arranged on said lead frame, and

an optically transparent member including a plurality of transparent blocks corresponding to and embedding said light emitting devices,

each of said blocks including a lens portion having an upper flat polygonal surface and a nearly reverse conical side wall portion in which the light emitted from the corresponding one of said light emitting devices is reflected to radiate uniform light beams from the upper flat polygonal surface,

the upper flat polygonal surface of said blocks constituting a continuous flat surface.

4,346,276

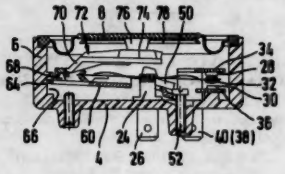
MULTIPLE PRESSURE SWITCH

Helmut Baader, Birkenweg 6, D-8470 Nabburg, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 214,948
Int. Cl.³ H01H 13/00
U.S. Cl. 200—329 5 Claims

1. A multiple pressure switch comprising an actuating member and a first and a second snap spring, said snap springs each having at least one electrical contact, said contacts each cooperating with a fixed electrical contact, said snap springs under

spring prestress each assume a starting position, and have a first and second point of application, respectively, for said actuating member, the actuating member being additionally supported on a third point of application, said three points of application lying on the corners of a conceived triangle and with a gradual increase of an external force acting within the triangle on the actuating member, the actuating member causes first the first



and then the second snap switch to snap over into an end position, wherein relative to a base plane E normal to the direction of application of said external force, said first point of application in its starting position lies higher and in its end position lies deeper than said second point of application in its original position, and the second point of application in its starting position lies higher and in its end position lies lower than the third point of application.

4,346,277

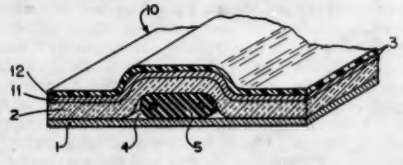
PACKAGED ELECTRICAL HEATING ELEMENT

Rudolph G. Wojtecki, Mantua, and Joseph P. Kaan, Stow, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 89,651, Oct. 29, 1979, Pat. No. 4,314,144. This application Apr. 22, 1981, Ser. No. 256,442

Int. Cl.³ H05B *3/34*

U.S. Cl. 219—528 **9 Claims**



1. An elongate flexible heating package having sufficient flexibility to conform to an item to be heated to which the package is secured and adapted to improve the heating efficiency of an elongate, electrically insulated, electrical heating element contained within the package, said package comprising;

a first layer comprising a wall made from a flexible heat conductive material that extends longitudinally along the length of the package and is adapted to establish a heat contacting relationship to the item to be heated to which the package is secured,

a second layer secured along the length of the package to the side of said first layer that faces away from the item to be heated to which the package is secured, said second layer comprising a wall made from a flexible heat insulative material,

a third layer secured along the length of the package to the side of said second layer that faces away from said first layer, said third layer comprising a wall made from a flexible heat resistant material that is adapted to protect said second layer, said third layer comprising a metal foil having a mylar film disposed along the length of the package on the side of said third layer that faces away from said second layer, said first, second and third layers being of substantially the same width, and an elongated cavity extending along the length of the package between a portion of said first layer wall and the composite wall comprising a portion of said second and said third layer walls, said cavity containing said electrical heating element and having an open-ended cross-sectional configuration that permits the heating element to be axially inserted into and removed from the cavity for replacement and repair without having to remove the package from the item to be heated to which the package is secured.

4,346,278

METHODS AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING

Sushantha K. Bhattacharyya, and Mohamed F. El-Menshawy, both of Birmingham, England, assignors to National Research Development Corporation, London, England

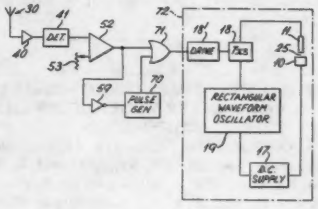
PCT No. PCT/GB78/00051, § 371 Date Aug. 13, 1979, § 102(e) Date Aug. 6, 1979, PCT Pub. No. W079/00379, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 8, 1978, Ser. No. 154,411

Claims priority, application United Kingdom, Dec. 13, 1977, 51713/77

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 M **15 Claims**



11. A method of E.D.M. machining comprising:

repeatedly carrying out first and second operations, the first operation being the application of a substantially continuous voltage between an electrode and a workpiece to provide sparking in a gap between the electrode and the workpiece, and the second operation being the removal of the said substantially continuous voltage for an interval; and

deriving a monitoring signal representative of the degree of sparking in the gap, the second operation commencing when the monitoring signal indicates that sparking in the gap is below a predetermined level.

4,346,279

NARROW GAP WELDING TORCH WITH REPLACEMENT TIP

Gerald G. Lessmann, Pittsburgh, Pa.; Ronald P. Simpson, Old Saybrook, Conn., and Ronald D. O'Brokta, Allegheny Township, Armstrong County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

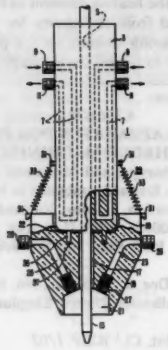
Filed Apr. 24, 1980, Ser. No. 143,207

Int. Cl.³ B23K *9/16*

U.S. Cl. 219—75 **2 Claims**

1. A narrow groove welding torch comprising an electrode holder having a rectangular cross-section with cooling ducts disposed within the electrode holder and a replaceable tip disposed on one end of the electrode holder, the tip having a generally rectangular cross-section, a centrally disposed opening extending through the tip with rectangular shaped counterbores on each end of the opening, blanketing gas ducts are disposed in the tip and extend from leading and trailing sides of the tip into one of the counterbores, the ducts having diffusers disposed therein adjacent one of the counterbores to supply a gentle flow of shielding gas to one of the counterbores, the

other counterbore receiving the electrode holder and having insulating packing disposed therein between the electrode holder and the tip, and the tip being detachably attached to the



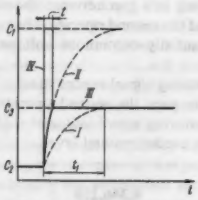
electrode holder and being held to the electrode holder by springs which fit over hooks disposed on both the electrode holder and the replaceable tip.

4,346,280

METHOD AND APPARATUS FOR BUILDING UP SURFACE LAYER WITH ALTERNATING COMPOSITION

Sergei V. Gulakov, ulitsa M.Mazaya, 41, kv.2; Boris I. Nosovsky, ulitsa Kuprina, 23a, kv.30; Leonid K. Leschinsky, prospekt Lenina, 75b, kv.60; Ksenofont K. Stepnov, ulitsa Daine vostochnaya, 50, kv.4, and Anatoly E. Rudnev, bulvar Bogdana Khmelnitskogo, 18, kv.35, all of Zhdanov Donetskoi oblasti, U.S.S.R.

Filed Jul. 1, 1980, Ser. No. 164,949
Int. Cl.³ B23K *9/04*
U.S. Cl. 219—76.1 **2 Claims**



1. A method of building up a variable-composition metal layer on a metal blank, comprising the steps of:

supplying at least two alloying materials to a metal zone melted by an arc and restricted by a solidification boundary;

varying the ratio of said alloying materials with respect to the required amount of certain portions of the built-up layer within 0.01 to 20% for a decrease in the alloying degree and within 0.01 to 100% for an increase in the alloying degree; and

maintaining said ratio for a period of time determined from the following relationship:

$$t = \frac{V}{v \cdot A} \cdot \ln \frac{C_1 - C_2}{C_1 - C_3},$$

where

V is the volume of the metal melted by the arc and restricted by the solidification boundary,

v is the building-up rate,

A is the cross-sectional area of the built-up layer,

C_1 is the amount of alloying elements varied with respect to the necessary amount,

C_2 is the initial amount of alloying elements relative to which variations are made, and

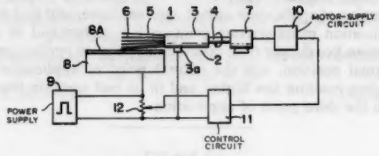
C_3 is the required amount of alloying elements in the built-up layer and subsequent changes in the amount of alloying elements to reach the required level.

4,346,281

METHOD OF AND APPARATUS FOR DISCHARGE-SURFACING ELECTRICALLY CONDUCTIVE WORKPIECES

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jan. 17, 1980, Ser. No. 112,817
Int. Cl.³ B23P *17/00*
U.S. Cl. 219—76.13 **28 Claims**



1. In a method of discharge-treating a surface of an electrically conductive workpiece by bringing said surface and an electrode together to form a localized contact therebetween, iteratively effecting a spark discharge across a gap between said electrode and said surface to form a weld at the contact area upon said surface, breaking said contact to permit said weld to cool thereby leaving a metallurgically modified area upon said surface and sweeping said electrode over said surface to successively form such metallurgically modified areas over said surfaces, the improvement which comprises: forming said electrode of a plurality of electrically conductive elongate pieces fixedly mounted to a rotary shank so as to individually project axially therefrom and extending so as to collectively form a converging body of revolution axially opening away from said shank and with said pieces lying along generatrices of the body of revolution; rotating said shank to permit said elongate pieces to be revolved and to uniformly expand the body of revolution outwardly toward the ends of said pieces remote from said shank while revolving; urging the outer lateral surfaces of said revolving pieces along a length thereof tangentially against said workpiece surface and so that the expanded body of revolution is tangential to said surface while an electric current is applied between said pieces and said workpiece to bring about spark discharge between said revolving individual surfaces of pieces and said workpiece surface thereby creating said metallurgically modified area where said pieces and said workpiece are brought together.

4,346,282

METHOD OF EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210. This application Oct. 5, 1978, Ser. No. 948,979
Int. Cl.³ B23K *11/18*
U.S. Cl. 219—78.16 **11 Claims**

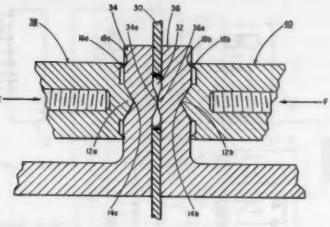
1. A method of welding lead parts through an aperture in the partition of a battery case utilizing an electrode comprising at least an extruding portion for extruding portions of said parts to touch within said aperture, and a forging portion for forging

portions of said parts during the welding of said parts, comprising the steps of:

a. positioning said parts on opposite sides of said aperture to at least entirely overlap said aperture;

b. extruding at least a portion of said parts into said aperture at least until said forging portion contacts a surface of said part and said extruded portions touch within said aperture;

c. limiting the degree of contact between said parts within said aperture responsive to the degree of contact between said forging portion and said lead part;



d. passing current through said parts to melt said portions of said parts at least within said aperture;

e. compressing at least said melted portions within said aperture; and

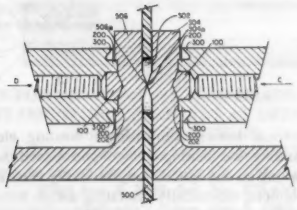
f. forging unmelted portions of said parts surrounding said aperture at least during a portion of said compression step, whereby said lead parts are welded through said partition of said battery case.

4,346,283

METHOD OF EXTRUDING, FUSING AND FORGING LEAD CONNECTIONS IN BATTERY CASES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210.
This application Apr. 11, 1979, Ser. No. 29,255
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ B23K *11/18*
U.S. Cl. 219—78.16 **7 Claims**



1. A method of welding lead parts through an aperture in the wall of a battery case to form a connection therethrough, said aperture having a substantially flat surface region disposed around the perimeter thereof, utilizing an electrode comprising at least an upsetting portion for upsetting portions of said parts to touch within said aperture, and a bevelled forging portion for forging portions of said lead parts in an area generally adjacent said flat surface region during the welding of said parts, comprising the steps of:

(a) positioning said parts on opposing sides of said aperture to at least entirely overlap said aperture;

(b) upsetting at least a portion of said parts into said aperture at least until said forging portion contacts a surface of said parts and said parts touch within said aperture;

(c) passing current through said parts to melt said portions of said parts at least within said aperture;

(d) compressing at least said melted portions within said aperture; and

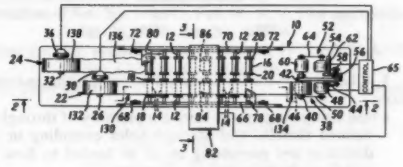
(e) forging, with said bevelled forging portion, portions of said parts generally surrounding said aperture and opposite said flat surface region at least during a portion of said compression step, whereby said lead parts are welded through said wall of said battery case.

4,346,284

DUAL PATH WEB TRANSPORT AND PROCESSING APPARATUS WITH RADIANT ENERGY DIRECTING MEANS

Everett C. Grollimund, Midlothian, and Peter Martin, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,450
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LK **13 Claims**



1. Web transport and treatment apparatus comprising:

(a) a web support structure defining at least two independent web transport paths;

(b) means for emitting radiant energy;

(c) means for selectively directing such radiant energy along at least two separate routes, a first one of said routes extending into a first treatment zone aligned with a first one of said transport paths, a second one of said routes extending into a second treatment zone aligned with a second one of said transport paths;

(d) at least two payout stands;

(e) at least two takeup stands, a respective one of said payout stands and a respective one of said takeup stands being associated with each of said paths so that a web can be fed along either one of said paths by the payout and takeup stands associated therewith; and

(f) control means for actuating said payout and takeup stands to feed a series of webs along alternate ones of said paths so that each web is fed along one of said paths while the payout and takeup stands associated with another one of said paths are idle, said control means also being operative to coordinate the operation of said directing means to direct said radiant energy into the treatment zone aligned with each of said paths while a web is being fed along such path, whereby each web in the series may be loaded onto an idle payout stand and threaded along the path associated with such stand while another web in the series is being fed along another path and treated by said radiant energy.

4,346,285

HEATING DEVICE EMPLOYING THERMISTOR WITH POSITIVE COEFFICIENT CHARACTERISTIC

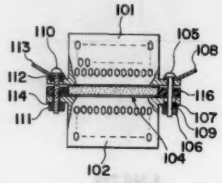
Toshikazu Nakamura, Yokaichi, and Hirofumi Yoshida, Shiga, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

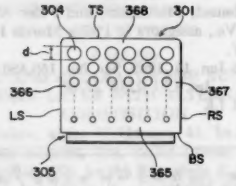
Filed Apr. 23, 1980, Ser. No. 143,040

Claims priority, application Japan, Apr. 28, 1979, 54-53138; Apr. 28, 1979, 54-53139; May 4, 1979, 54-55121; May 11, 1979, 54-58340

Int. Cl.³ H05B *3/00;* H01C *7/02*

U.S. Cl. 219—381 22 Claims





1. A heating device for heating fluid comprising, in combination:

a heat dissipating means having a plurality of through-holes defined therein, said through-holes extending in a first direction and permitting air to be heated to flow along said first direction only;

a heating unit including a thermistor element having a positive temperature coefficient characteristic, said thermistor element being adapted to generate heat when electric power is applied thereto, said heat dissipating means being mounted on said heating unit in thermal conductive relation therewith such that heat generated by said heating unit is transmitted to the heat dissipating means to heat fluid flowing through the through-holes, said thermistor element including a pair of electrodes between which heating current flows, the location of said electrodes being such that said current flows in a second direction substantially perpendicular to said first direction; and

means for connecting said heat dissipating means and the heating unit together.

4,346,286

TEMPERATURE CONTROLLED ELECTRICAL POWER SUPPLY APPARATUS

Frederick J. Romp, Keysborough, Australia, assignor to Canargo International Pty. Ltd., Victoria, Australia

Filed Feb. 20, 1981, Ser. No. 236,457

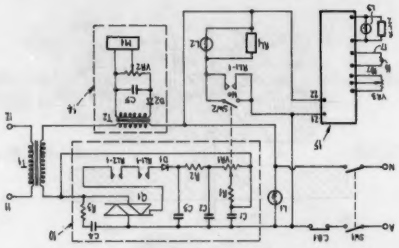
Int. Cl.³ H05B *1/02*

U.S. Cl. 219—501 6 Claims

1. Temperature controlled electrical power supply apparatus for heating carpet-joining tape of the kind having a conducting foil adapted to be heated by electric current to melt adhesive thereon, said apparatus comprising:

first control circuitry for receiving AC power supply voltage and including a set of electrical contacts to provide an adjustable high current output, a first adjustable resistor for enabling adjustment of said high current output, a switch parallelly connected with the first normally open contacts of a first relay and mechanically connected with said switch such that closure thereof activates said first relay, said first relay including second normally open contacts which are closed to enable said high current output; and

second control circuitry including a thermistor adapted to be connected in thermal contact with said foil, switching circuitry connected to said thermistor to interrupt said



high current output when the temperature of said foil reaches a preset temperature to maintain the temperature of said foil at a substantially constant temperature, said second control circuitry further including an SCR with a gate circuit connected to said thermistor, a second relay controlled by said SCR for controlling said set of electrical contacts to interrupt said high current output and connected in series with said second normally open contacts.

4,346,287

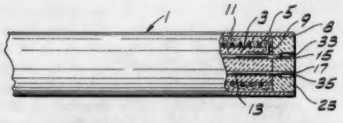
ELECTRIC HEATER AND ASSEMBLY

George B. Desloge, St. Louis, Mo., assignor to Watlow Electric Manufacturing Company, St. Louis, Mo.

Filed May 16, 1980, Ser. No. 148,593

Int. Cl.³ H05B *3/08*

U.S. Cl. 219—541 33 Claims



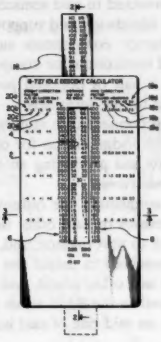
1. An electrical heater comprising a heating element, a sheath surrounding said heating element and spaced therefrom, said sheath having an end spaced longitudinally from an end of the heating element, electrically insulating means between the heating element and the sheath, an internal lead pin electrically connected to the heating element and extending toward said end of the sheath, an electrically insulating end plug within said sheath at said end thereof having an opening in its inner face into which the outer end of said pin is received, and a hole in its outer face having its centerline offset from the centerline of said pin but laterally bounded in part by a lateral surface of said pin, and an external lead having an inner terminal, the hole in the end plug receiving the inner terminal of the external lead, said lateral surface of the pin being generally complementary in shape to an adjacent portion of the lateral surface of the inner terminal, the sheath holding the end plug in a laterally compressed state, whereby the end plug holds said inner terminal and said internal lead in engagement with each other to form a lapped connection therebetween interiorly of the insulating end plug.

4,346,288

FUEL SAVING AIRCRAFT DESCENT CALCULATOR

Edward T. Foster, 1653 Berwick Pl., Westlake Village, Calif. 91361

Filed Oct. 31, 1980, Ser. No. 202,601
Int. Cl.³ G06G 1/02; G06C 3/00
U.S. Cl. 235—70 A 14 Claims



1. A manually operable calculator for calculating a beginning of descent position to optimize aircraft fuel consumption during descent from an actual altitude and distance to a target altitude and distance, comprising:

a first member having a distance scale displayed thereon,

a second member having a first altitude scale displayed thereon, said first altitude scale being proportional in terms of indicated air speed below a predetermined altitude,

said first and second members being mutually alignable and said distance and first altitude scales being proportioned so that, when a target distance on the distance scale is aligned with a target altitude on the first altitude scale, the actual altitude on the first altitude scale is aligned with a desired fuel efficient distance on the distance scale for commencing the descent, for a given aircraft weight and speed and a given wind condition,

an aircraft weight and wind correction scale means, said correction scale means providing a correction factor to adjust the indicated distance for commencing a descent based upon the aircraft weight and prevailing wind conditions, and

means mutually securing said first and second members for relative aligned movement.

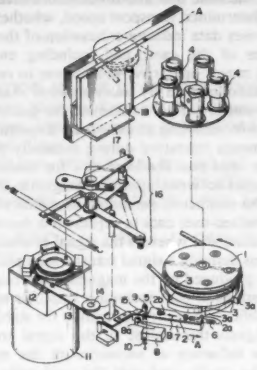
4,346,289

DEVICE FOR STOPPING SUCTION HEADS OF PAPER SHEET COUNTING APPARATUS AT DETERMINED ANGULAR POSITIONS

Tuyoshi Miyagawa, and Hitoshi Manabe, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,630
Claims priority, application Japan, Jun. 5, 1980, 55/78242[U]
Int. Cl.³ G06M 9/02; B65H 3/12
U.S. Cl. 235—98 R 2 Claims

1. A device for stopping the suction heads of a paper sheet counting apparatus at predetermined angular positions to be ready for immediately sucking the first sheet of the next cycle counting operation, comprising a rotary cylinder carrying a group of suction heads and having a peripheral face provided with engaging recesses each corresponding to each one of said suction heads to determine the angular positions of said suction heads when one cycle paper sheet counting operation is terminated and the rotary disk is stopped, a stopper having a pawl to be engaged with one of said recesses to stop and fix said rotary cylinder during the standstill time when said suction heads are to be stopped at predetermined angular position, said stopper having an elongated hole extending in the longitudinal direction thereof to receive a shaft about which said stopper is to be swinged, said stopper being movable relative to said shaft in the longitudinal direction within the extent defined by the



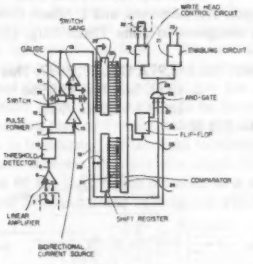
length of said elongated hole, and a resilient member for damping the sliding movement of said stopper relative to said shaft when said pawl is engaged with one of said engaging recesses.

4,346,290

DEVICE FOR THE RECOGNITION AND PROGRESSIVE CANCELLATION OF INFORMATION RECORDED ON A MAGNETIC SUPPORT

Mario Rossi, corso Vittorio Emanuele 74, Turin, Italy

Continuation of Ser. No. 878,577, Feb. 16, 1978. This application Jul. 26, 1979, Ser. No. 60,766
Claims priority, application Italy, Mar. 4, 1977, 67474 A/77
Int. Cl.³ G06K 7/08, 19/08
U.S. Cl. 235—436 5 Claims



1. An improved apparatus of the type employed to generate an enablement signal used to enable operation of a dispensing machine or the like under the control of data magnetically recorded in a single data track on the magnetic strip of a credit card, the data on the magnetic strip including key data identifying the card as a valid one and number-of-permitted-uses data identifying the number of times the credit card is to be permitted to enable operation of a dispensing machine, the improved apparatus comprising, in combination, a guide structure defining a path for manual transport of a credit card along said path; a read-write head unit including magnetic data reading means and magnetic data-writing means located along said path so that the magnetic strip of a manually inserted card pass along the read-write head unit during the manual transport of the card in said path, the magnetic data reading means being operative during the manual transport of the card for converting magnetically recorded data present on the strip into read out electrical signals, signal-evaluating means connected to receive

the read out electrical signals from the magnetic data reading means and operative for recognizing the key data despite the unpredetermined speed of the manual transport of the card relative to the head unit and furthermore ascertaining, despite the unpredetermined transport speed, whether the number-of-permitted-uses data indicate exhaustion of the number of permitted uses of the card, and including enablement-signal-generating means operative, in response to recognition of the key data accompanied by ascertainment that the number of permitted uses is not yet exhausted, for generating an enablement signal for enabling an automatic dispensing machine; and updating means operative during manually performed transport of the card past the head unit for causing the magnetic writing means to write upon the magnetic strip in a manner updating the number-of-permitted-uses data to cause the number-of-permitted-uses data to represent a decreased number of permitted uses, and wherein the signal-evaluating means comprises means defining a signal transmission path for the electrical signals produced by the magnetic data reading means, the signal transmission path including amplifier means with automatic amplification control operative for stabilizing the signal level of signals transmitted in the signal transmission path against the influence of variations in the manual transport speed of the credit card past the read-write head unit, and wherein the apparatus further comprises a credit card having a magnetic strip on which are recorded key data identifying the card as a valid one and number-of-permitted-uses data identifying the number of times the credit card is to be honored, and on which are furthermore recorded a series of bits spatially located in the card such that the series of bits reaches the read-write head unit prior to the key data and prior to the number-of-permitted-uses data, whereby the amplifier means with automatic amplification control can begin to adapt itself to the speed of manual transport of the credit card by responding to the electrical signals derived by the magnetic reading means from said series of bits.

4,346,291

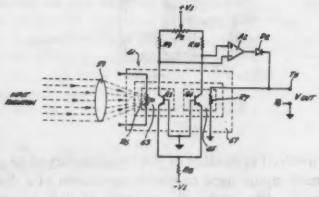
THERMALLY ISOLATED MONOLITHIC SEMICONDUCTOR DIE

Roy W. Chapel, Jr., Edmonds, and I. Macit Gurol, Seattle, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Division of Ser. No. 842,972, Oct. 17, 1977. This application Sep. 2, 1980, Ser. No. 182,966

Int. Cl.³ G06G 7/20

U.S. Cl. 250—211 R **21 Claims**



1. An RMS converter for converting the RMS value of an input signal into an output signal having a DC value equal to the RMS value of the input signal, said RMS converter comprising:

a semiconductor die including a frame defining an aperture and first and second islands located in said aperture, each of said islands including a semiconductor component formed therein and a resistor formed thereon so as to be in thermal communication with the semiconductor component formed therein, said semiconductor die further including a plurality of support leads equal in number to the number of terminals defined by said semiconductor components and said resistors, said support leads extending outwardly from said islands to said frame so as to provide the sole support for said islands, each of said support leads including a layer of a structurally strong metal of high electrical conductivity and low thermal conductivity, said layer of structurally strong metal being substantially thicker than any other layer of said support leads;

input circuit means for applying said RMS signal to the resistor on one of said islands via the support leads connected to said resistor;

bridge means connected to said semiconductor components formed in said islands via said support leads connected to said semiconductor components such that said bridge means and said semiconductor components form a bridge circuit having a pair of opposed power terminals and a pair of opposed output terminals;

comparison means connected to said pair of opposed output terminals of said bridge circuit for comparing the signals at said terminals and producing an output related to the difference therebetween;

feedback means connecting the output of said comparison means to the resistor on said other island via said support leads connected to said resistor; and,

output means connected to detect the voltage drop across said resistor on said other island, said voltage drop having a DC value equal to the RMS value of the signal applied to said resistor on said one of said islands.

4,346,292

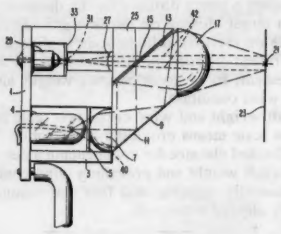
COAXIAL OPTICAL SCANNER

Wilson M. Routt, Jr., Lexington, and Donald L. West, Winchester, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,936

Int. Cl.³ H01J 3/14

U.S. Cl. 250—216 **13 Claims**



1. An optical scanner having a light source, a first optical system for directing light from said source to a predetermined region, a photosensor, and a second optical system for collecting light reflected from markings on a surface at said region and directing said reflections on to said photosensor wherein the improvement comprises:

said first optical system comprising a collecting lens, a first reflective planar surface, and a second reflective planar surface parallel to said first planar surface, and an outer condenser lens, the center area on the axis of said condenser lens being part of said second optical system, said first optical system being adapted and arranged to collect light emitted by said light source, direct said light in a beam formed by said collecting lens, reflect said beam from said first surface to said second surface, reflect at least a part of said beam from said second surface to said condenser lens, and focus said beam by said condenser lens near said predetermined region, and

said second optical system comprising an objective lens and an area within said second planar surface adapted to transmit light from said center area of said condenser lens to said photosensor.

4,346,293

OPTICAL ELECTRONIC DISTANCE SENSOR WITH A PARALLEL BEAM OF LIGHT AND ADJUSTABLE DETECTOR-EMITTER SEPARATION

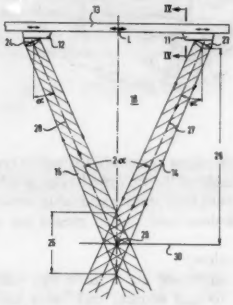
Günter Fetzer, Gundelfingen, Fed. Rep. of Germany, assignor to Erwin Sick GmbH - Optik-Elektronik, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 138,033

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 7916322[U]

Int. Cl.³ G01V 9/04

U.S. Cl. 250—222 R 7 Claims



1. V-light barrier apparatus for sensing the presence and absence of an object on a surface, comprising a straight mounting rail extending in a first direction, a light transmitter mounted on said rail and constructed to transmit a parallel beam of light along a transmitted beam path at a fixed and invariable angle relative to said rail, a light receiver mounted on said rail and constructed to receive a parallel beam of light along a received beam path at a fixed and invariable angle relative to said rail, with the transmitted beam path and the received beam path intersecting over an intersection region at a distance from said rail, means enabling movement of said light transmitter and said light receiver along said rail to adjust their relative separation, and thereby said distance, to bring said intersection region into coincidence with one of said surface and said object without varying the size or shape of said intersection region, and means for securing said light transmitter and said light receiver to said mounting rail.

4,346,294

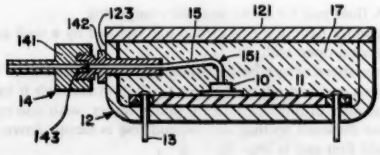
LOW PROFILE OPTICAL COUPLING TO PLANAR-MOUNTED OPTOELECTRONIC DEVICE

Neil P. Albaugh, and Robert M. Stitt, both of Tucson, Ariz., assignors to Burr-Brown Research Corp., Tucson, Ariz.

Continuation of Ser. No. 55,032, Jul. 5, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,841

Int. Cl.³ G02B 5/14

U.S. Cl. 250—227 4 Claims



1. A low profile fiber optic module comprising:

a housing; and

at least one optoelectronic device disposed within said housing; and

light fiber means having a first portion passing through and supported only by a side portion of said housing and having a second substantially orthogonal freestanding portion for coupling extramodular light to said device through substantially a 90° angle, said second portion being supported only by and being biased against said device.

4,346,295

RADIATION IMAGE READ OUT DEVICE

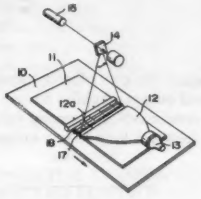
Kazuyoshi Tanaka; Hisatoyo Kato, and Seiji Matsumoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1979, Ser. No. 105,240

Claims priority, application Japan, Dec. 26, 1978, 53-163572; Jul. 11, 1979, 54-87806; Jul. 11, 1979, 54-87807; Jul. 11, 1979, 54-87808

Int. Cl.³ G03C 5/16; G01T 1/11; G02B 5/14

U.S. Cl. 250—327.2 9 Claims



1. A radiation image information read out device for reading out radiation image information recorded on a stimulable phosphor plate by scanning the stimulable phosphor plate with a stimulating ray comprising in combination a photodetector for detecting the light emitted by the stimulable phosphor plate upon stimulation of the stimulable phosphor, and a light guide member provided between the photodetector and the stimulable phosphor plate for transmitting the light emitted by the stimulable phosphor plate to the photodetector, said light guide member being made of a light transmitting sheet material one end of which is located adjacent to a scan line on the stimulable phosphor plate and the other of which is located adjacent to the light receiving face of the photodetector and shaped to be adapted to be adjacent to the light receiving face wherein said end to be located adjacent to the scan line is shaped into a linear form and the other to be located adjacent to the light receiving face of the photodetector is shaped into an annular form to be adapted for the light receiving face of the photodetector and wherein the ratio of a length from said one end to the other of the light guide member to a width of the end to be located adjacent to the scan line is within the range of 0.4 to 1.5.

4,346,296

NON-DISPERSIVE INFRARED GAS ANALYZER

Robert E. Passaro, Walnut Creek, and Kevin Williams, Pinole, both of Calif., assignors to Andros Analyzers Incorporated, Oakland, Calif.

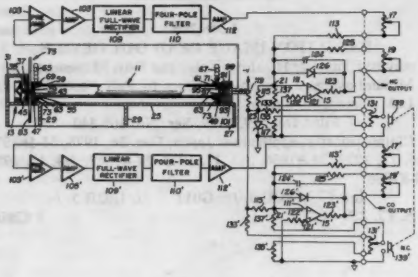
Filed Aug. 15, 1980, Ser. No. 178,302

Int. Cl.³ G01N 21/26

U.S. Cl. 250—343 11 Claims

1. A non-dispersive infrared gas analyzer, comprising, a sample cell for containing the gas mixture to be analyzed, means for directing infrared energy through said sample cell, means for periodically interrupting the infrared energy at a predetermined frequency, detector means responsive to the infrared energy at at least one preselected wavelength to produce an AC signal having an amplitude proportional to the infrared energy passing through said sample cell and having a frequency corresponding to the predetermined frequency, said preselected wavelength corresponding to the characteristic absorption wavelength of a preselected gas, and signal processing means for processing the AC signal output of said detector

means to produce a DC signal having an amplitude proportional to the concentration of the preselected gas in the mixture being analyzed, said signal processing means including an output amplifier and first variable control means manually



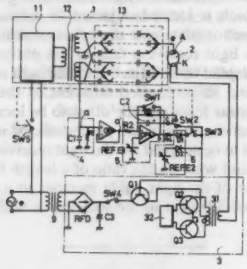
adjustable to adjust the gain of said output amplifier to bring the output of said output amplifier to zero with a non-absorbing gas in said sample cell, and second variable control means connected in a feedback loop to said output amplifier for span calibration.

4,346,297

X-RAY PHOTOGRAPHIC APPARATUS

Masakazu Suzuki, Kyoto; Shuhei Furuichi, Shiga, and Toshiaki Ikeda, Yahata, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jun. 26, 1981, Ser. No. 277,889
Claims priority, application Japan, Jun. 27, 1980, 55-88061
Int. Cl.³ H05G *1/34, 1/58*
U.S. Cl. 378—110 **3 Claims**



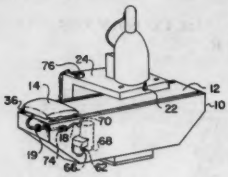
1. An X-ray photographic apparatus designed to irradiate X-rays of desired density from an X-ray tube by controlling an X-ray tube current at a desired value set by a reference voltage (Ref. E1) by deriving the X-ray tube current in the form of a detection voltage (Va), integrating the voltage difference between said detection voltage (Va) and said reference voltage (Ref. E1) for setting the desired value of said X-ray tube current, using the integrated voltage as a control signal, and feeding back and controlling a filament heating current, said X-ray photographic apparatus being characterized in that the apparatus has a tube current automatic control circuit (3) for preventing overshooting of the tube current generated at the start of X-ray irradiation by presetting the initial integration value of an integration circuit (5) to a preheating level setting voltage (Ref. E2) lower than said reference voltage (Ref. E1), said integration circuit being designed to integrate the difference between said detection voltage (Va) and said reference voltage (Ref. E1).

4,346,298

AUTOMATIC AIR PILLOW FOR DIAGNOSTIC X-RAY MACHINE

Jagannath K. Dixit, 1128 Sioux Dr., Crown Point, Ind. 46307

Filed Mar. 2, 1981, Ser. No. 239,674
Int. Cl.³ A61B *6/04*
U.S. Cl. 5—441 **6 Claims**



1. An inflatable pillow assembly for use in connection with an examination table of the tip type having a table surface and having motor means for rotating said table between horizontal and vertical positions and switch means for actuating said motor:

an inflatable pillow,

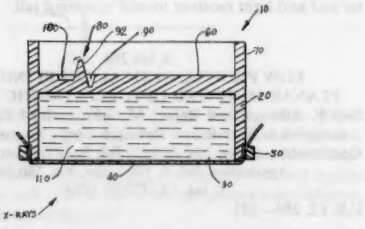
a source of compressed air; a three-way valve connecting said pillow to said source; said valve including a vent outlet; said valve being actuated by said switch means whereby said pillow is inflated when said table is brought to said horizontal position and is deflated when said table is brought to said vertical position; and support means for detachably securing said pillow to said table.

4,346,299

CELL FOR CONTAINING FLUID TO BE ANALYZED BY X-RAY SPECTROSCOPY

Arthur J. Mitteldorf, Scotch Plains; Joseph Marcovecchio, Berkeley Heights, and Rodolfo A. Boquiron, New Monmouth, all of N.J., assignors to Snex Industries Inc., Metuchen, N.J.

Filed May 18, 1981, Ser. No. 264,566
Int. Cl.³ G01N *21/00*
U.S. Cl. 378—204 **4 Claims**



1. A fluid cell for x-ray analysis comprising

a cylinder having a first closed end defined by a wall and a second open end,

a thin sheet of synthetic resinous material fitted over said open end and adapted to pass radiation through it into a quantity of fluid disposed in said cylinder, with said cylinder disposed so that said second end is facing down and said first end is up,

wall-rupturing means formed in said closed end for rupturing said closed end to accommodate fluid flow from within said cylinder when said fluid heats and expands due to said radiation,

said means being formed near to but inwardly of the periphery of said wall and comprising a vertical post which rises from a portion of said wall which defines said first closed

end of said cylinder, at least a part of said portion of said wall being thinner than said wall and rupturable by means of pressure applied to said post to cause said post to tend to pivot, and

an upstanding rim rising from said wall and defining the periphery of said closed end and being of sufficient height to contain fluid which may be present on said closed end after said means has been operated to rupture said wall.

4,346,300
FILM SHEET CASSETTE

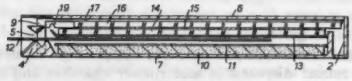
George F. A. M. Turner, Ingatestone, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 28, 1980, Ser. No. 135,024

Claims priority, application United Kingdom, Apr. 20, 1979, 7913880

Int. Cl.³ G03D *13/08, 13/10*

U.S. Cl. 206—455 **12 Claims**



1. A fixed plate cassette comprising a frame with fixed front and back plates, a pressure plate positioned between said front and back plates, a parallel top plate supported in said frame, means connected to said frame for moving said top plate, a first array of permanent magnetic poles of alternating polarity and a second array of permanent magnets, in which the pressure plate is held in operative position when the cassette is in the closed state by the force of magnetic repulsion exerted between said first array of permanent magnetic poles of alternating polarity which is integral with or is attached to said pressure plate and said second coacting array of permanent magnets attached to said parallel top plate, the pressure plate being retractable from the operative position by activating said moving means causing said parallel top plate to slide to a position in which the magnetic poles in said first array of magnetic poles attract the dissimilar poles of said second array, thereby moving said pressure plate towards said parallel top plate, so opening the cassette.

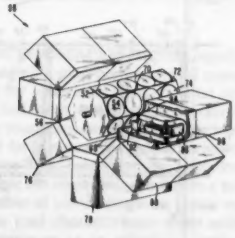
4,346,301
ION IMPLANTATION SYSTEM

William P. Robinson, Newbury Park, and Robert L. Seliger, Agoura, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 61,578, Jul. 30, 1979, Pat. No. 4,258,266. This application Mar. 19, 1981, Ser. No. 245,285

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—492.2 **10 Claims**



1. An ion implantation system comprising:

a plurality of high current separated ion sources, each of said high current ion sources comprising:

a plasma chamber having an anode and a cathode, a feed supply to said plasma chamber for supplying feed material to be ionized in said plasma chamber, walls defining a narrow rectangular exit slot from said plasma chamber, through which slot ions are extracted along a path to form a high aspect ratio ribbon ion beam of substantially rectangular crosssection and having a height and a thickness;

magnetic field means for producing in said plasma chamber a magnetic field across said path in the direction of the height of the beam;

first and second separator electrodes positioned on opposite sides of said path laterally of said path in the thickness dimension of the beam for applying an electric field across said path, said separator electrodes being positioned with respect to said magnetic field means so that said electric field is transverse with respect to said magnetic field to separate unwanted ion species laterally from the ion beam; and

a target drum rotating on an axis for circumferentially carrying therearound a plurality of target wafers, said plurality of separated ion sources being positioned radially around said target drum, each of said plurality of separated ion sources being positioned to impinge upon the target as the target is moved to provide a multiple implantation on the target.

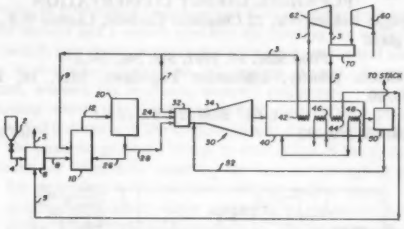
4,346,302
OXYGEN BLOWN COAL GASIFIER SUPPLYING MHD-STEAM POWER PLANT

Carl R. Bozzuto, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 28, 1980, Ser. No. 144,124

Int. Cl.³ H02N *4/02*

U.S. Cl. 290—1 R **12 Claims**



1. An apparatus for generating power from the combustion of coal comprising:

a. an oxygen-blown magnetohydrodynamic generator having a burner for producing a high temperature working gas and a generation channel for directly generating electric power from the high temperature working gas, the generation channel connected to the burner so as to receive the high temperature working gas;

b. an oxygen-blown gasifier for producing a combustible medium BTU gas to be combusted in the burner of said magnetohydrodynamic generator;

c. means for supplying coal to said gasifier;

d. means for supplying preheated compressed oxygen to said gasifier and to the burner of said magnetohydrodynamic generator;

e. a gas cleaner disposed downstream with respect to gas flow of said coal gasifier for removing sulfur compounds, nitrogen compounds, and particulate matter including fly ash and unburned carbon from the combustible medium BTU gas produced in said gasifier;

f. a first gas pass connected between said coal gasifier and said gas cleaner thereby providing a gas path for conveying the combustible medium BTU gas from said gasifier to said gas cleaner;

g. a first transport means interconnected between said gas cleaner and said gasifier for conveying a portion of the particulate matter removed from the combustible medium BTU gas in said gas cleaner back to said gasifier for gasification of the unburned carbon contained therein;

h. a second gas pass connected between said gas cleaner and the burner of said magnetohydrodynamic generator for conveying the clean combustible medium BTU gas to the burner of said magnetohydrodynamic generator for combustion therein;

i. means operatively associated with said magnetohydrodynamic generator for injecting a seed material into the high temperature working gas produced in the burner of said magnetohydrodynamic generator as the high temperature working gas enters the generation channel of the magnetohydrodynamic generator, said seed material being readily ionized upon injection into the high temperature working gas so as to enhance the conductivity of the working gas passing through the generation channel of said magnetohydrodynamic generator;

j. a vapor generator connected to the generation channel of said magnetohydrodynamic generator so as to receive the seeded high temperature working gas passing out of the generation channel, said vapor generator having heat transfer surface whereby heat is transferred from the high temperature working gas to a liquid to generate a vapor as a source of power; and

k. a flue connected to said vapor generator for venting the working gas passing through said vapor generator to the atmosphere.

4,346,303

CONTROL SYSTEM FOR AN ELECTRICALLY DRIVEN VEHICLE WITH THREE GENERATORS AND FLYWHEEL ENERGY CONSERVATION

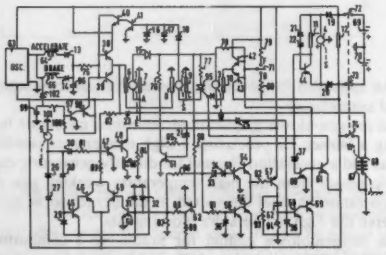
Dragan Bukatarevic, 22 Cheniston Gardens, London W.8., England

Filed Mar. 16, 1981, Ser. No. 244,277

Claims priority, application Yugoslavia, Mar. 18, 1980, 733/80

Int. Cl.³ B60L *11/04, 11/16*

U.S. Cl. 290—45 **10 Claims**



1. A control system for an electrically driven vehicle, comprising a prime mover for driving first generator means (1), electric traction motor means (3) for converting electrical energy generated by the first generator means (1) into mechanical energy propelling the vehicle, second generator means (3) operative during deceleration of the vehicle to convert kinetic energy of the vehicle into electrical energy, second motor means (2) for converting electrical energy generated by the second generator means during said deceleration into mechanical energy stored in mechanical energy accumulator means, and third generator means (2) operative during subsequent acceleration of the vehicle to convert mechanical energy stored in the mechanical energy accumulator means into electrical energy for driving the electric traction motor means (3).

4,346,304

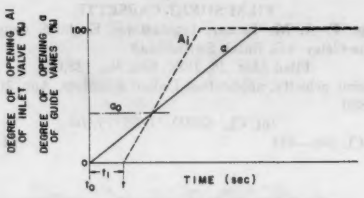
METHOD OF CONTROLLING OPERATION OF FRANCIS TYPE PUMP TURBINES

Sachio Tsunoda, and Kaneo Sugishita, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 25, 1980, Ser. No. 210,238

Int. Cl.³ F01D *15/10*

U.S. Cl. 290—52 **5 Claims**



1. In a Francis type pump turbine comprising a runner chamber, a runner disposed in said runner chamber and directly coupled to a synchronous dynamoelectric machine for operating the same as a synchronous condenser or a synchronous generator, a spiral casing disposed to surround said runner chamber, guide vanes disposed between said runner chamber and said spiral casing, an inlet valve positioned at an inlet of said spiral casing, and a draft tube connected to said runner chamber, a method of controlling an operation of said Francis type pump turbine comprising the steps of

completely or substantially completely closing said inlet valve and said guide vanes;

admitting compressed gas into said runner chamber to press down water level therein to a predetermined level in said draft tube so as to cause said runner to rotate in said gas thereby operating said synchronous machine as a synchronous condenser;

releasing said gas from said runner chamber; and

then initiating opening of said inlet valve and said guide vanes so as to switch the operation of said dynamoelectric machine from synchronous condenser operation to synchronous generator operation.

4,346,305

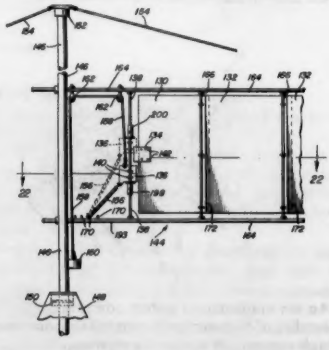
GOVERNOR FOR FLUID CURRENT MOTOR

Forest B. White, Bison, S. Dak. 57620

Continuation-in-part of Ser. No. 746,012, Nov. 30, 1976, abandoned. This application Mar. 27, 1979, Ser. No. 24,324

Int. Cl.³ F03D *3/00, 7/04*

U.S. Cl. 290—55 **13 Claims**



1. A fluid current motor, comprising, in combination; vane

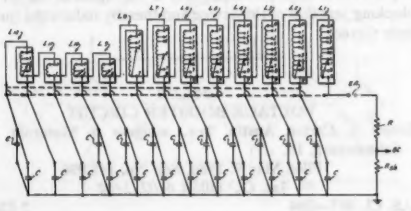
means supported for rotation about a central axis, support means mounting the vane means for said rotation in the fluid current in order to translate the fluid current into useful mechanical or electrical energy, said vane means comprising at least one pair of parallel spaced frame members and at least one flapper pivotally mounted between the frame members, said vane means further including stop means provided between said frame members for limiting pivotal movement of said flapper when the flapper is moving with the fluid current, while permitting the flapper to swing parallel to a direction of flow of the fluid current when the flapper is moing against the direction of flow of the fluid current, a governor system to limit the rotation of said vane means in the fluid current, said governor system including a control stop pivotally mounted on control support means extending between said frame members and being capable of pivotal movement on said control support by direct contact with said fluid current so as to respond to the speed of said fluid current, said control stop being engageable with said flapper whenever the fluid current speed is below a predetermined limit and disengageable from said flapper when the speed of said fluid current exceeds the predetermined limit whereby the rotational movement of said vane is severely limited, said governor system further including an adjustable tension means for maintaining said control stop engageable with said flapper whenever the current speed is below a predetermined limit, said adjustable tension means being secured to said control stop and extending to one of said frame members, said tension means being mounted for movement along said one frame member to adjust the response of said control stop to said fluid current speed, said tension means being a spring tension means in which the response of said control stop can be controlled by the tension of said spring, the tension of said spring being responsive to the distance between said control support means and the point wherein said spring is mounted to said one frame member.

4,346,306

METHOD AND APPARATUS FOR GENERATING HIGH CURRENT IMPULSES

Petre Arabadji, Bucharest, Romania, assignor to Institutul de Cercetari Pentru Industria Electrotehnica, Bucharest, Romania

Filed Sep. 4, 1979, Ser. No. 72,467
Claims priority, application Romania, Sep. 1, 1978, 95085
Int. Cl.³ H03K *3/00*
U.S. Cl. 307—108 **6 Claims**



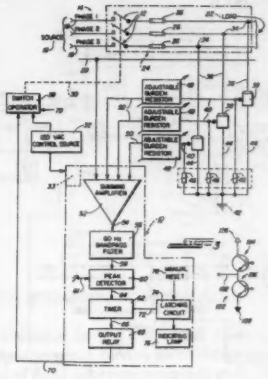
1. A method of generating high current impulses comprising the steps of charging a plurality of parallel connected pairs of capacitors both for generating long-duration rectangular current impulses, and high amplitude short-duration impulses, determining the stage capacity as a common value of the solutions established for variants having as a parameter the number of stages, the latter being between the possible lower and upper limits which insure the impulse shape within a tolerance range, varying the number of circuit stages to obtain various impulse shapes when the load characteristics differ widely, using the coil internal resistances as an effective circuit synthesis element, and eliminating the coils and using the internal impedance and internal inductance of the circuit during the generation of high amplitude short-duration current impulses thereby optimizing the energy efficiency and achieving compatibility in long-duration and short-duration rectangular impulse generator.

4,346,307

VOLTAGE-UNBALANCE DETECTOR FOR POLYPHASE ELECTRICAL SYSTEMS

John A. Zulaski, Mount Prospect, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Nov. 3, 1978, Ser. No. 957,267
Int. Cl.³ H01H *83/14*
U.S. Cl. 307—130 **9 Claims**



1. An improved detector for use with high-voltage, polyphase switch-gear, the switch-gear being of the type which includes an interrupter-switch-power-fuse combination in each phase thereof and a switch operator for opening the switches, the switch-gear being connectable between a source and loads of a high-voltage, polyphase, alternating current, electrical system, wherein the improved detector comprises:

sensing means for providing a first time-varying output signal indicative of the magnitude and phase orientation of the phase-to-ground voltage on each phase of the system;

means for vectorially summing the first output signals and for providing a second time-varying output signal, the peak value of which varies according to variations in the phase orientation and magnitude of the phase-to-ground voltage on each phase of the system so that the peak value of the second output signal is zero if the vector sum of the phase-to-ground voltage is zero, and so that the peak value of the second output signal is non-zero if the vector sum of the phase-to-ground voltages is not zero;

means for comparing the peak value of the second output signal to a reference signal and for providing an error signal if the peak value of the second output signal is non-zero by more than a predetermined value, the error signal indicating that the phase-to-ground voltage variations exceed predetermined limits, the comparing means

(a) providing the error signal upon the passage of a first time period which begins when the peak value of the second output signal is non-zero by more than the predetermined value, and

(b) eliminating the error signal upon the passage of a second time period which begins when the peak value of the second output signal either is zero or is non-zero by less than the predetermined value,

the first time period being substantially less than the second time period;

timer means responsive to the error signal for providing a third output signal a predetermined time after initiation of the error signal only if such error signal persists for such predetermined time; and

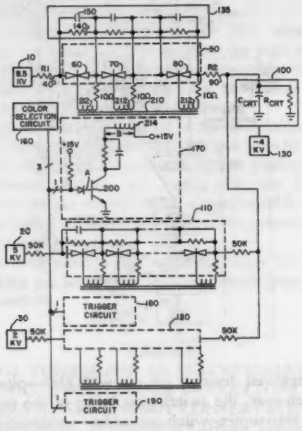
means responsive to the third output signal for initiating the switch operator to operate the switches.

4,346,308

DC SWITCHING CIRCUIT WITH CURRENT THROUGH RESISTIVE LOAD BELOW HOLDING CURRENT OF TRIAC STRINGS TO CHARGE CAPACITIVE LOAD TO PREDETERMINED POTENTIALS

Eugene K. Severson, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 11, 1978, Ser. No. 968,244
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—252 B **1 Claim**



1. A bidirectionally conductive switching circuit for selectively coupling dc voltages to a load, the switching circuit comprising:

a load having a capacitance that can be charged and discharged, and having a resistance high enough to limit the current due to the resistance to a value less than either of the first and second holding currents for the first and second serial strings of triacs recited below:

a first dc voltage supply;

a first serial string of triacs, each triac thereof having first and second conduction terminals and a gate terminal, the conduction terminals coupled serially between the first dc voltage supply and the load, the first serial string having a first holding current beneath whose value the string will no longer conduct in the absence of a signal applied to the gate terminals;

a first trigger means having a plurality of outputs each individually coupled to an associated gate terminal in the first serial string of triacs, for synchronously applying to the gate terminals a periodic signal switching the triacs conductive to charge the capacitance in the load toward the voltage of the first dc voltage supply until the charging current falls below the value of the first holding current and for thereafter maintaining the voltage at that level;

a second dc voltage supply of voltage different in value than the voltage of the first dc voltage supply;

a second serial string of triacs, each triac thereof having first and second conduction terminals and a gate terminal, the conduction terminals coupled serially between the second dc voltage supply and the load, the second serial string having a second holding current beneath whose value the string will no longer conduct in the absence of a signal applied to the gate terminals; and

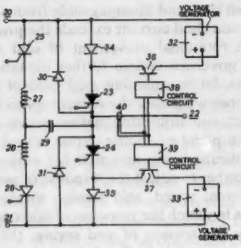
a second trigger means having a plurality of outputs each individually coupled to an associated gate terminal in the second serial string of triacs, for synchronously applying to the gate terminals a periodic signal switching the triacs conductive to discharge the capacitance in the load toward the voltage of the second dc voltage supply until the discharging current falls below the value of the second holding current and for thereafter maintaining the voltage at that level.

4,346,309

CONTROLLABLE RECTIFIER CIRCUIT

John M. Garrett, and Kenneth G. King, both of Chippenham, England, assignors to Westinghouse Brake and Signal Co., Ltd., Chippenham, England

Filed Jan. 18, 1980, Ser. No. 113,190
Claims priority, application United Kingdom, Jan. 23, 1979, 7902378; May 15, 1979, 7916812
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 M **8 Claims**



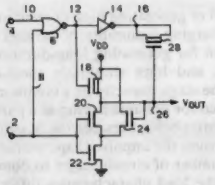
1. A controllable rectifier circuit comprising a controllable rectifier device capable of blocking forward current flow in a load current path through the device; current source means, operative in response to a trigger signal, for passing a blocking recovery assisting current in a forward sense through the device; and current sensing means for sensing the level of load current through the device and producing the said trigger signal for the current source in response to the load current falling below a threshold value equal to or less than the forward holding current of the device, the blocking recovery assisting current produced by the current source means being equal to or less than the forward holding current so as to deplete the current carrier density in the region of the forward blocking junction of the device and thereby reduce the turn-off time thereof.

4,346,310

VOLTAGE BOOSTER CIRCUIT

Ernest A. Carter, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1980, Ser. No. 148,096
Int. Cl.³ H03K *6/02, 5/02*
U.S. Cl. 307—264 **7 Claims**



1. A circuit for generating, at an output node, a voltage which is higher than the circuit's supply voltage, comprising:

a first field-effect-transistor having a source electrode coupled to ground, a drain electrode coupled to said output

node and a gate electrode coupled to a disabling signal for turning said first field-effect-transistor off;

a second field-effect-transistor of a depletion type having a source electrode coupled to said output node, a drain electrode coupled to said supply voltage and a gate electrode coupled to an enabling signal for turning said second field-effect-transistor on when said first field-effect-transistor turns off to produce a first voltage at said output node; and

voltage boost means coupled to said output node and responsive to the termination of said enabling signal for increasing the voltage at said output node, said voltage boost means comprising:

inverter means having an input coupled to said enabling signal and having an output; and

a third field-effect-transistor having source and drain electrodes coupled to the output of said inverter means and having a gate electrode coupled to said output node.

4,346,311

PULSE GENERATOR CIRCUIT

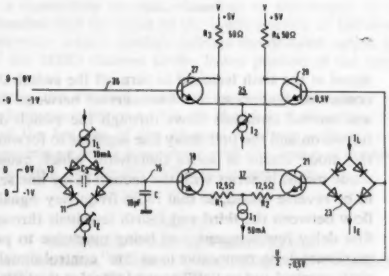
Peter Aue, Böblingen, and Werner Hüttemann, Herrenberg-Kuppingen, both of Fed. Rep. of Germany, assignors to Hewlett-Packard GmbH, Böblingen, Fed. Rep. of Germany

Filed Jul. 28, 1980, Ser. No. 172,871

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932655

Int. Cl.³ H03K *5/12, 6/00*

U.S. Cl. 307—268 **4 Claims**



1. A pulse generator circuit for generating pulses having predetermined slopes, comprising

a capacitor that can be charged and discharged through predetermined current sources;

a switching device for connecting and disconnecting the current sources and a step function signal source for controlling the switching device, the capacitance of the capacitor being in the range of the stray capacitance of the switching devices; and

means for superimposing a fraction of the output signal of the step function signal source in opposite phase upon the output signal of the capacitor so as to compensate the voltage surge in the output signal of the capacitor resulting from the voltage divider formed by the stray capacitance of the switching device and the capacitor.

4,346,312

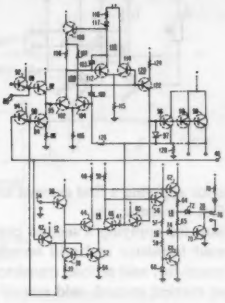
INTEGRATED SEMICONDUCTOR CURRENT DRIVER CIRCUITRY

Warren A. Christopherson, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 921,142, Jun. 30, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,756

Int. Cl.³ H03K *5/01, 19/003*

U.S. Cl. 307—270 **8 Claims**



1. Integrated semiconductor current driver circuitry comprising

an output transistor having a collector electrode connected to an output terminal, having another electrode connected to a point of fixed reference potential, and having a further electrode,

a current switching circuit having one input terminal connected to a source of bistatic signal voltage, having another input terminal connected to a source of regulated reference potential, and having a pair of complementary output terminals,

a pair of emitter follower circuits having input terminals connected individually to said complementary output terminals of said current switching circuit and having complementary output terminals, and

one diode connected between said output terminal of one of said emitter follower circuits and said collector electrode of said output transistor,

another diode connected directly between said output terminal of the other of said emitter follower circuits and said further electrode of said output transistor,

a further diode connected to said other of said emitter follower circuits and to said point of fixed reference potential, and

an electric connection between said further electrode of said output transistor and said output terminal of said one emitter follower circuit.

4,346,313

MONOLITHIC INTEGRATED THRESHOLD SWITCH

Lothar Blossfeld, Freiburg-Hochdorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 20, 1976, Ser. No. 688,519

Int. Cl.³ H03K *5/153;* **G01R** *19/165, 19/175*

U.S. Cl. 307—350 **7 Claims**

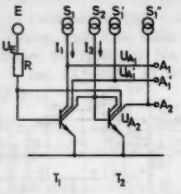
1. A monolithic integrated threshold switch which switches on at an upper voltage valve of a hysteretic input voltage/output voltage characteristic and switches off at a lower voltage comprising:

a first transistor having at least first and second collectors;

a second transistor having a first collector coupled to the base of said first transistor and said second transistor having a second collector coupled to the base of said second transistor and to said second collector of said first transis-

tor, the emitters of said first and second transistors being coupled together;

means for applying an input current to the base of said first transistor and said first collector of said second transistor for turning on said first transistor which in turn cuts off said second transistor;



first means for applying a first current to said first collector of said first transistor; and

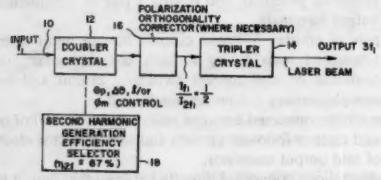
second means for applying a second current to the base of said second transistor and said second collector of said second transistor, said second transistor turning off when said input current exceeds said second current.

4,346,314

HIGH POWER EFFICIENT FREQUENCY CONVERSION OF COHERENT RADIATION WITH NONLINEAR OPTICAL ELEMENTS

Robert S. Craxton, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed May 1, 1980, Ser. No. 145,409
Int. Cl.³ H03F *7/04*
U.S. Cl. 307—427 **34 Claims**



1. The method of converting the frequency of coherent radiation from a source with the aid of at least one non-linear optical element through which said radiation passes, which method comprises the steps of first converting said radiation from said source at a predetermined conversion efficiency which provides coherent radiation of at least two different frequencies each of which having energy at a predetermined ratio to the other, corresponding to the ratio of said different frequencies, and then converting said radiation to a third frequency by combining said radiation of said different frequencies to produce output radiation of said third frequencies with optimal overall efficiency of conversion.

4,346,315

SWITCHED DELAY LINE FOR STEERABLE NULL ANTENNA SYSTEM

Eugene L. Roberts, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

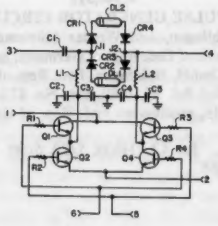
Filed Aug. 25, 1980, Ser. No. 180,554
Int. Cl.³ H03K *5/14, 17/66*
U.S. Cl. 307—603 **4 Claims**

1. A delay unit for providing an incrementally variable delay for radio frequency signals, comprising:

a plurality of delay line sections connected in tandem for said radio frequency signals and also for direct current bias;

wherein each delay line section comprises first and second delay line segments in parallel between first and second junction points, each of said delay line segments having diode means in series with it between said junction points polarized in opposite directions, the first delay line segment being relatively short and the second delay line segment being of a length to provide a given differential delay assigned to that section, switch control means comprising four switch devices connected in a bridge configuration, first and second terminals for bias current connected to diagonally opposite points of the bridge configuration, with the other diagonal having its end points connected via first and second inductors respectively to said first and second junction points, third and fourth terminals coupled respectively to said first and second junction points with at least one blocking capacitor, fifth and sixth terminals for control signals, each of said four switch devices having a control terminal, the fifth terminal being connected to the control terminals of diagonally opposite ones of said switch devices and the sixth terminal being connected to the control terminals of the other two switch devices;

each said section being operative to provide minimum delay responsive to an "on" control signal at the fifth terminal to turn on the switch devices coupled thereto and to an "off"



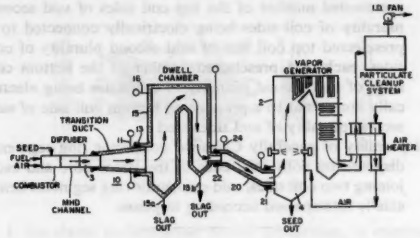
signal at the sixth terminal to turn off the switch devices connected thereto so that bias current between the first and second terminals flows through the switch devices turned on and the first delay line segment to forward bias the diode means in series therewith, which causes the diode means in series with the second delay line segment to be reverse biased, so that radio frequency signals may flow between the third and fourth terminals through the first delay line segment; and being operative to provide maximum delay responsive to an "on" control signal at the sixth terminal and an "off" control signal at the fifth terminal so that the switch devices are in the states to cause the bias current between the first and second terminal to flow through the second delay line segment to forward bias the diode means in series therewith and to reverse bias the diode means in series with the first delay line segment, so that the radio frequency signals flow through the second delay line means; the delay unit having each delay line section except the last connected with said first and fourth terminals connected respectively to said second and third terminals of the next section, with a direct-current constant current source connected to the second terminal of the first section and the first terminal of the last section, and with said third terminal of the first section and said fourth terminal of the last section connected to place the delay unit in a radio frequency signal path for flow of radio frequency signals in either direction.

4,346,316

APPARATUS FOR RETROFITTING AN EXISTING STEAM GENERATOR WITH AN MHD TOPPING UNIT

Stanley R. Wysk, Suffield, and Mark Palkes, Glastonbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 19, 1980, Ser. No. 150,834
Int. Cl.³ G21D 7/02
U.S. Cl. 310—11 7 Claims



1. A connecting system between an MHD channel and a pre-existing steam generator, including,

an MHD channel operated to produce electrical energy while discharging an output of gas containing vaporized seed and slag at a high velocity and high temperature,

a pre-existing steam generator adapted to receive the gas output and condensed seed of the MHD channel,

a transition conduit lined with water-cooled refractory connected directly to the MHD channel to receive the output gas and vaporized seed and slag,

a chamber lined with water-cooled refractory connected to the output of the transition conduit to receive the channel output gas and vaporized seed and slag and sized to provide a dwell time of substantially two seconds for the gas and vaporized seed and slag in the chamber,

means for removing condensed slag from the lower portion of the chamber in separation from subsequently condensed seed,

and a connecting conduit connected to the output of the chamber and the input of the lower portion of the steam generator which conduit delivers the delayed output gas of the MHD channel to the lower portion of the steam generator,

whereby the channel gas is delayed long enough in the reducing conditions within the chamber to attenuate NO_x and the hot gas of the channel has been reduced to a temperature range compatible with the design of the heat-absorbing waterwalls of the steam generator.

4,346,317

GASIFIED COAL-FIRED SYSTEM

John H. Fernandes, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 18, 1980, Ser. No. 179,326
Int. Cl.³ H02N 4/02
U.S. Cl. 310—11 3 Claims

1. A system for generating electrical power from the combustion of coal and air, comprising,

an MHD channel having a combustor to which fuel and air are supplied for combustion,

a coal-gasifier connected to the combustor as the source of fuel,

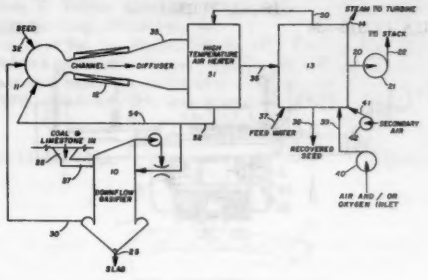
a source of coal and lime/limestone connected to the gasifier within which the coal is converted to gaseous fuel for the combustor and from which slag is produced containing sulfur from the coal and particulate matter,

a vapor generator connected to the output of the channel to receive its products of combustion and transfer their heat to water in converting the water to steam,

a steam turbine and electric generator connected to the steam output of the vapor generator to convert the steam energy into electrical energy,

a source of combustion air connected to the vapor generator to transfer heat from the products of combustion to the combustion air,

a heat exchanger connected between the channel and vapor generator and combustion air outlet of the vapor genera-



tor to transfer heat from the products of combustion from the channel to the combustion air heated by the vapor generator,

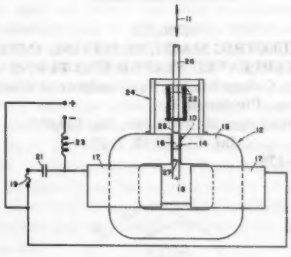
and a connection between the heat exchanger and the combustor to supply the heated combustion air to the combustor in support of the combustion of the fuel supplied by the gasifier.

4,346,318

LINEAR MOTION DEVICES

Shmuel Shtrikman, Rehovot, Israel, assignor to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Feb. 21, 1979, Ser. No. 13,680
Claims priority, application Israel, Feb. 22, 1978, 54107
Int. Cl.³ H02K 33/12
U.S. Cl. 310—12 6 Claims



1. Apparatus for producing linear motion comprising:

a coil defining an electromagnetic field across a gap; and

a permanent magnet comprising first and second sections, magnetized in respective opposite directions disposed within the magnetic field in said gap for driving engagement with the electric field, the permanent magnet being configured such that its axes of magnetization lie along its smallest dimension;

an iron core about which said coil is wound, said core being formed of a plurality of layers laminated together, the laminations being stacked along axes perpendicular to the flow of magnetic flux in said core; and

a coil spring coupling said permanent magnet to a fixed support, said coil spring extending along a spring axis which is perpendicular to said magnetization axes and

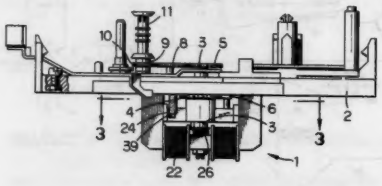
parallel to an axis along which the permanent magnet is driven in motion.

4,346,319

ROTARY ELECTROMAGNETIC ACTUATOR

Nobuyuki Naganuma, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 3, 1981, Ser. No. 250,837
Claims priority, application Japan, Apr. 15, 1980, 55-50182
Int. Cl.³ H02K *33/00*
U.S. Cl. 310—36 **5 Claims**



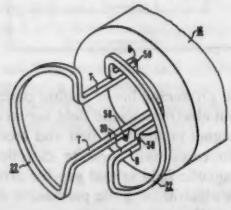
1. In a rotary electromagnetic actuator comprising a stator having at least two stator poles, each of which has a pole surface; a rotor having at least two rotor poles, each of which has a pole surface, rotatably arranged so as to enable each of the pole surfaces of the stator to face to the corresponding pole surface of the rotor respectively; an electromagnetic coil wound on the stator for energizing the stator pole to rotate the rotor in one direction; means cooperating with the rotor for rotating the rotor in opposite direction when the electromagnetic coil is not energized; and first positioning means and second positioning means for determining a rotating range of the rotor; the improvement wherein said each pole surface of said stator poles is in a form of plural steps in an ascending arrangement in said one direction for providing plural stator pole edges, and said each pole surface of said rotor poles is in a form of plural steps as many as said steps of said stator pole in a descending arrangement in said one direction for providing rotor pole edges, and the pitch of the rotor pole edges is different from the pitch of the stator pole edges.

4,346,320

DYNAMOELECTRIC MACHINE HAVING IMPROVED INTERLEAVED STATOR END TURNS

Kent R. Davey, College Station, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 10, 1980, Ser. No. 139,081
Int. Cl.³ H02K *1/16*
U.S. Cl. 310—179 **5 Claims**



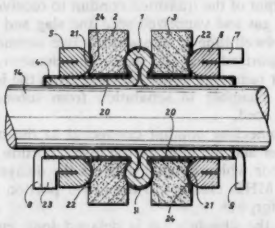
1. A dynamoelectric machine comprising:
a generally tubular-shaped stator core having a plurality of slots in the periphery of said stator core;
a multiphase winding constituting a first plurality of coil sides receivable in a first plurality of said stator core slots, each of said first plurality of stator slots having a top one and a bottom one of said first plurality of coil sides disposed therein, each of the top coil sides of said first plurality of coils sides being electrically connected to a preselected bottom coil side of said first plurality of coil sides, each of the bottom coil sides of said first plurality of coil sides being electrically connected to a preselected top coil side of said first plurality of coil sides,
a second plurality of coil sides receivable in a second plurality of said stator slots, each of said second plurality of stator slots having a top one and a bottom one of said second plurality of coil sides disposed therein, each of a preselected number of the top coil sides of said second plurality of coil sides being electrically connected to a preselected top coil side of said second plurality of coil sides, each of a preselected number of the bottom coil sides of said second plurality of coil sides being electrically connected to a preselected bottom coil side of said second plurality of coil sides; and
a plurality of generally C-shaped connector ring segments disposed on both axial ends of the stator core and each joining two coil sides, said connector ring segments being axially interspersed according to phase.

4,346,321

SLIP RING RETAINER MECHANISM

Manfred Frister, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 6,921, Jan. 26, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,865
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808347
Int. Cl.³ H02K *13/02*
U.S. Cl. 310—232 **14 Claims**



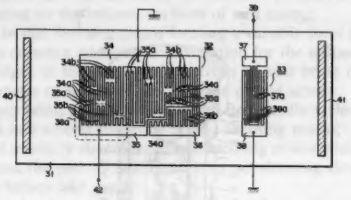
1. In a dynamo electric machine, having a shaft (**14**), a slip ring retainer device for mounting at least two slip rings (**2, 3**) on the shaft comprising a material selected from the group consisting of graphite and a graphite metal mixture, positioned axially adjacent each other on the shaft (**14**) of the machine
wherein the inside diameter of each of said slip rings (**2, 3**) is sufficiently large so that the respective slip ring is mounted on the shaft without the application of substantial radial force comprising
means for applying axially directed compressive forces against the axial end faces of the slip rings mounted on said shaft at respective opposite axial faces of the adjacent slip rings for exerting substantially only axially directed retaining forces on said slip rings pressing the slip rings towards each other, said compressive force applying means including
metallic pressure rings (**5, 6**) coaxially surrounding said shaft, positioned at respective opposite axial end faces of said slip rings, and applying axially directed retaining forces against the axial faces of the slip rings, said pressure rings being provided with terminal connecting means,
and insulating separating means separating said slip rings from each other.

4,346,322

ELASTIC SURFACE WAVE DEVICE

Kouji Sato, Yokohama; Sadao Takahashi, Tokyo, and Toshikazu Kodama, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 18, 1980, Ser. No. 131,538
Claims priority, application Japan, Mar. 22, 1979, 54/32245
Int. Cl.³ H03H *9/00*
U.S. Cl. 310—313 B 6 Claims



1. An elastic surface wave device comprising, in combination:

a piezoelectric substrate;

at least one electromechanical transducer provided on one surface of the substrate;

said transducer comprising first and second comb electrodes each having respective finger electrodes arranged with the finger electrodes of the first comb electrode interdigitating with the finger electrodes of the second comb electrode in a predetermined overlap length weighting fashion for forming therein an overlap region and non-overlap region; and

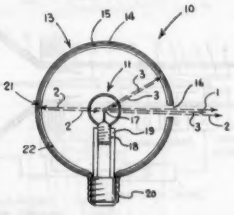
a dummy electrode insulated from said first and second comb electrodes and formed on said one surface of said substrate adjacent thereto in said non-overlap region, said dummy electrode comprising non-interdigitating fingers and being substantially at ground potential.

4,346,323

INFRARED RADIATION LAMP

Tomas Hirschfeld, Livermore, Calif., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Sep. 17, 1979, Ser. No. 75,934
Int. Cl.³ H01K *1/32*
U.S. Cl. 313—111 13 Claims



1. An improved radiation generating lamp operating in the near infrared to infrared range, comprising:

spherical reflective means, said reflective means defining a window; and

an incandescent source of radiation centered within said reflective means for generating radiation in the visible range and in the near infrared to infrared range;

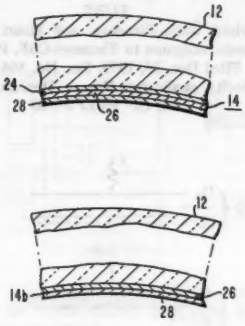
said reflective means receiving said radiation emanating from said source and reflecting back to said source at least a portion of said radiation in the visible range and in the infrared and near infrared range, said source absorbing at least a portion of said reflected radiation in the visible range and re-directing at least a portion of said reflected radiation in the near infrared range to infrared range through said window, such as to enhance the emission characteristics of said lamp in the near infrared to infrared range.

4,346,324

HEAT MIRROR FOR INCANDESCENT LAMP

Bulent E. Yoldas, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 84,217, Oct. 12, 1979, Pat. No. 4,293,593, which is a continuation-in-part of Ser. No. 65,706, Aug. 10, 1979, abandoned, which is a continuation of Ser. No. 931,346, Aug. 8, 1978, abandoned. This application May 14, 1981, Ser. No. 263,432
Int. Cl.³ H01K *1/32*
U.S. Cl. 313—112 6 Claims



5. An electric incandescent lamp comprising a sealed regularly conformed hollow thin-walled light-transmitting vitreous envelope, a heat mirror carried on the interior surface of said envelope, said heat mirror operative to substantially transmit visible radiations and to substantially reflect infrared radiations, incandescent filament means of coiled configuration operatively positioned within said envelope so that infrared radiations emitted therefrom during lamp operation will be reflected by said heat mirror to impinge upon said filament means thereby to enhance the conversion of electric energy to visible energy, and said heat mirror consisting essentially of:

a. a thin continuous silver layer of predetermined thickness carried directly on the interior surface of said envelope, said silver layer being substantially transmissive for visible radiations and substantially reflective for infrared radiations; and

b. a thin continuous layer substantially comprising titania carried over and adhered to the interior surface of said silver layer, and said layer substantially comprising titania having a predetermined thickness within the range of from about 100 to about 400 Angstroms.

4,346,325

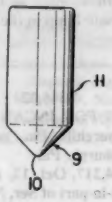
ELECTRON GUN

Mamoru Nakasuji, Yokohama, and Hirotsugu Wada, Machida, both of Japan, assignors to VLSI Technology Research Association, Japan

Filed Mar. 27, 1980, Ser. No. 134,677
Claims priority, application Japan, Mar. 31, 1979, 54-38546
Int. Cl.³ H01J *1/16, 19/10*
U.S. Cl. 313—336 3 Claims

1. An electron gun for a shaped-beam-type electron beam

delineating system, comprising: a cathode including a single



crystal of lanthanum hexaboride having a convex end portion with a tip radius ranging between 260 and 1,000 microns.

4,346,326

RADIOLOGICAL IMAGE INTENSIFIER TUBE AND RADIOLOGICAL CHAIN INCORPORATING SUCH A TUBE

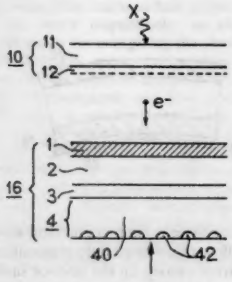
Bertrand Driard; Jean Ricodeau, and Henri Rougeot, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 26, 1979, Ser. No. 106,487

Claims priority, application France, Dec. 29, 1978, 78 36957

Int. Cl.³ H01J *31/00*

U.S. Cl. 313—388 **3 Claims**



1. A radiological image intensifier tube with a video output combining in a vacuum envelope on either side of a target which is in four parts, on the one hand means transforming the incident X-ray image into a beam of photoelectrons directed towards the target and producing thereon an impact under the action of which an electrical image of the incident image is formed in the target, and on the other hand means for reading the electrical signals constituting the thus formed image, wherein on the side exposed to the photoelectrons this target has three successive layers consisting of a metal barrier covering a layer of luminescent material, the latter being in contact with a semi-transparent layer covering the actual target in which is formed the said electrical image.

4,346,327

DISPLAY TUBE FOR DISPLAYING COLOR PICTURES

Piet G. J. Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

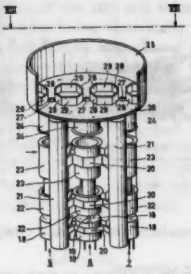
Filed Feb. 5, 1979, Ser. No. 9,580

Claims priority, application Netherlands, Feb. 27, 1978, 7802129

Int. Cl.³ H01J *29/51, 29/76*

U.S. Cl. 313—413 **6 Claims**

1. A display tube for displaying color pictures, said display tube comprising a display window, a cone attached to said display window, a neck attached to said cone, a display screen provided on the inside of said display window and consisting of a large number of regions luminescing in three different colors, means disposed in said neck for generating three electron beams, the axes of said electron beams being situated substantially in one plane, a color selection electrode positioned before said display screen for assigning each electron beam to luminescent regions of one color, and a system of deflection coils, disposed around the transition of the neck to the cone of the display tube, for generating a first and a second orthogonal deflection field, the first deflection field having a field distribution which is strongly pin-cushion-shaped on the display screen side, and the second deflection field having a



field distribution which is strongly barrel-shaped on the display screen side, wherein said display tube further comprises correction elements placed near each electron beam for deforming the field distribution of the first deflection field, on the neck side near each electron beam, in a barrel-like manner and for deforming the field distribution of the second deflection field, on the neck side near each electron beam, in a pin-cushion-like manner whereby the effects of deflection defocusing on the display screen are considerably reduced in the vertical direction as well as the horizontal direction.

4,346,328

ELECTRON BEAM DEVICE WITH VARIABLE BEAM ENERGY

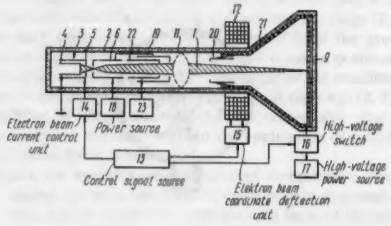
Sergei A. Rybalko, ulitsa Sovetskaya, 8a, kv. 94, Fryazino Moskovskoi oblasti, U.S.S.R.

Division of Ser. No. 888,563, Mar. 20, 1978, Pat. No. 4,211,953.

This application Nov. 27, 1979, Ser. No. 98,380

Int. Cl.³ H01J *29/46, 29/58*

U.S. Cl. 313—449 **3 Claims**



1. An electron beam device with variable electron beam energy comprising:

a sealed casing;

an electron source in said casing for shaping an electron beam;

a luminescent screen in said casing;

focusing means arranged in said casing for maintaining the optimal diameter of said beam in the plane of said screen with changes in the energy of the electrons of said beam;

an accelerating electrode for said focusing means having an input aperture for also shaping said beam; said electrode

being positioned across the path of said beam, after said electron source;

a first auxiliary electrode for said focusing means arranged across the path of said beam and located after said input aperture of said accelerating electrode and electrically coupled therewith;

a second electrode for said focusing means and axially symmetrical with said first electrode and arranged across the path of said beam after said first electrode and electrically coupled to said screen by means of a current-carrying coating on the internal surfaces of said casing;

a gap in said focusing means forming a variable focal power lens ensuring adequate compensation for the influence of changes in the energy of electrons of said beam on the diameter of said beam in the plane of said screen;

said gap being located between said first auxiliary electrode and said second electrode of said focusing means;

a third auxiliary electrode for said focusing means positioned across the path of said beam after accelerating electrode but before said gap;

there being a spacing between the end faces of said third electrode and said first electrode facing said screen;

said spacing being equal to or less than the maximum diameter of said first electrode multiplied by 1.5; and

the ratio between the minimum diameter of said first electrode and the minimum diameter of said third electrode ranging between 1.5 and 6.

4,346,329

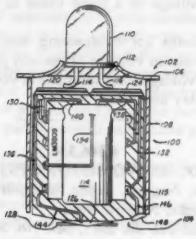
AIMING POST LIGHT

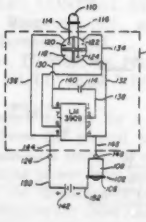
Robert C. H. Schmidt, 16001 Tonkawood Ct., Minnetonka, Minn. 55343

Division of Ser. No. 69,954, Aug. 27, 1979, Pat. No. 4,290,095. This application Sep. 26, 1980, Ser. No. 191,182

Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96;* **H01K** *1/62*

U.S. Cl. 315—51 **4 Claims**





1. A multi-option LED module light bulb comprising an electrically conductive cup and a rotatable insert positioned therein, an LED positioned on said cup with leads extending therein and into contact with the top of said insert,

said top of said insert being divided into a plurality of conductive segments whereby said leads contact selected segments,

said insert having an integrated circuit and capacitor embedded therein,

said circuit being connected to a center contact on the bottom of said base,

said circuit and said capacitor being connected to said segments whereby said LED is energized by those segments contacting said LED leads, and

means for rotating said insert to select segments for contact with said leads.

4,346,330

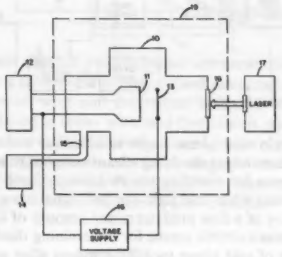
LASER GENERATED HIGH ELECTRON DENSITY SOURCE

Chunghsin Lee, Reading, and Peter E. Oettinger, Acton, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 14, 1980, Ser. No. 140,390

Int. Cl.³ H01J *45/00*

U.S. Cl. 315—150 **16 Claims**



1. Apparatus for thermionically generating high current pulses of electrons comprising:

a metallic target having a surface coated with adsorbed cesium atoms; and

laser means for directing a pulse of laser energy onto said target to heat a portion of the surface of said target, said pulse having a duration short compared with the residence time of said cesium atoms on said portion of the surface and having a power level sufficient to heat said portion of the surface to an electron emitting temperature below the melting point of said metallic target to cause thermionic emission of a high current pulse of electrons.

4,346,331

FEEDBACK CONTROL SYSTEM FOR APPLYING AC POWER TO BALLASTED LAMPS

Henri H. Hoge, Baltimore, Md., assignor to Enertron, Inc., Baltimore, Md.

Filed May 27, 1980, Ser. No. 153,528

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—158 **7 Claims**

1. A lighting feedback control system for applying an AC power signal from an AC power source to at least one lamp, comprising:

phase switching means connected in series with said lamp and said AC power source for switching power across said lamp, said phase switching means comprising a control terminal for switching said phase switching means to a low impedance state upon application of a phase control signal thereto;

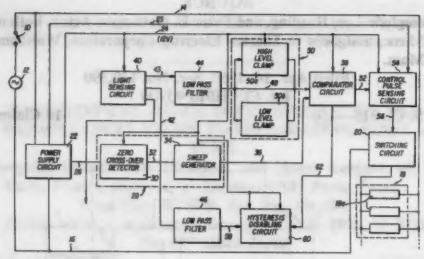
line switching means for enabling the application of AC power to said lamp through said phase switching means;

light sensing means for generating a light control signal indicative of an amount of light present in a predetermined location;

phase angle conduction control means having an input coupled to said light control signal for generating and apply-

ing said phase control signal to said control terminal of said phase switching means, said phase angle control means controlling the phase angle conduction time of said phase switching means based on the amount of light measured by said light sensing means to maintain a constant level of lighting, said phase angle control means comprising,

filter means for increasing the phase angle conduction time of said phase switching means from a predetermined minimum value to a steady state phase angle conduction time based on said light control signal after power enabling by said line switching means;



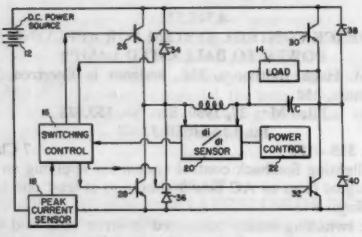
wherein said phase angle conduction control means comprises output disabling means coupled to said light sensing means for disabling the switching of said phase switching means when said light control signal has a first level indicative of a first predetermined amount of light, comprising hysteresis circuit means for maintaining disabled the switching of said phase switching means after said light control signal has said first level until said light control signal has a second level indicative of a second predetermined amount of light.

4,346,332

FREQUENCY SHIFT INVERTER FOR VARIABLE POWER CONTROL

John P. Walden, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 14, 1980, Ser. No. 177,942
Int. Cl.³ H05B *41/29, 41/392*
U.S. Cl. 315—307 **39 Claims**



1. A circuit for starting and varying the output of a gas discharge lamp comprising:

a variable frequency power source having an output;

a resonant matching network connected to the power source output, the matching network operative to transfer power from the source to the output of the network when the network output is loaded by a gas discharge lamp; and

control circuit means connected to said power source for controlling the frequency of the power source, including:

(i) a first sensing circuit operative to sense a signal representing a time derivative of a current flow in the matching network and produce an indication signal at an output of said circuit, the indication signal being zero whenever the time derivative is below a set threshold value of said first sensing circuit, and wherein the indication signal operates to control the frequency of said power source; and

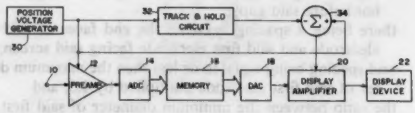
(ii) a variable threshold adjustment means coupled to said first sensing circuit for adjusting the setting of said threshold value and thereby varying said output of the lamp.

4,346,333

POSITION CONTROL CIRCUIT FOR A DIGITAL OSCILLOSCOPE

Thomas P. Dagostino, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 29, 1979, Ser. No. 76,532
Int. Cl.³ G01R *13/20*; G06F *3/147*; H01J *29/70*
U.S. Cl. 315—367 **5 Claims**



1. A position control circuit for a digital oscilloscope having a vertical deflection system including an input preamplifier operable in an acquisition mode and a display amplifier operable in a display mode, comprising:

means for generating a variably adjustable position voltage in both said acquisition and display modes, said position voltage being coupled to said preamplifier;

means for tracking said position voltage in said acquisition mode to develop a reference voltage which is equal in amplitude to said position voltage, and for holding said reference voltage at a fixed value in said display mode; and

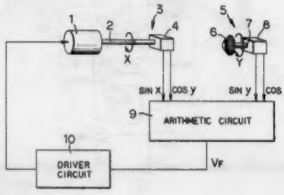
summation means for subtracting said reference voltage from said position voltage to thereby provide an algebraic summation voltage, said summation voltage being coupled to said display amplifier.

4,346,334

DC SERVOMOTOR SYSTEM

Toyokazu Inoue, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 20, 1981, Ser. No. 284,803
Claims priority, application Japan, Jul. 23, 1980, 55-100823; Jul. 24, 1980, 55-101709
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—45 **6 Claims**



1. A DC servomotor system comprising:

(a) a direct current motor;

(b) first signal generating means for producing, in response to rotary movement of said direct current motor, a first sine-wave signal A·SIN x and a first cosine-wave signal B·COS x, where x is an angle of rotation of said direct current motor, and A and B are constants;

(c) second signal generating means for producing a second

sine-wave signal C·SIN y and a second cosine-wave signal D·COS y, where y is a variable and C and D are constants;

(d) arithmetic means for processing said first sine- and cosine-wave signals A·SIN x and B·COS x and said second sine- and cosine-wave signals C·SIN y and D·COS y to produce a sine-wave signal E·SIN (y−x), where E is a constant; and

(e) means for amplifying said sine-wave signal E·SIN (y−x) and providing a thus amplified sine-wave signal E·SIN (y−x) to said direct current motor,

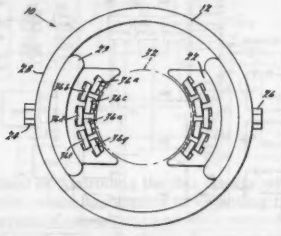
whereby said direct current motor is rotated in accordance with the signals produced from said second signal generating means.

4,346,335

SPEED CONTROL OF A D.C. ELECTRIC MOTOR

Stirling A. McInnis, 661 Kenyon St., Troy, Mich. 48084

Filed Apr. 7, 1981, Ser. No. 251,865
Int. Cl.³ H02P 7/10
U.S. Cl. 318—351 **30 Claims**



1. A stator assembly for a D.C. electric motor, comprising:

a yoke member;

at least one pair of opposing field pole members, each having a shank portion mounted to said yoke member, a face portion defined by a plurality of field pole leg members extending radially inwardly to form a bore for receiving an armature, and a core portion interposed radially between said shank portion and said face portion for providing a magnetic path between said shank portion and said face portion;

a field coil wound around said shank portion of each of said field pole members; and

a plurality of separately excitable field control coils wound individually around said field pole leg members of each of said field pole members.

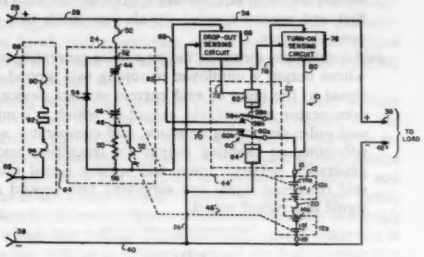
4,346,336

BATTERY CONTROL SYSTEM

James J. Crawford, Ringwood, N.J., assignor to Frezzolini Electronics, Inc., Hawthorne, N.J.

Filed Nov. 17, 1980, Ser. No. 207,647
Int. Cl.³ H02J 7/10
U.S. Cl. 320—9 **8 Claims**

1. A recharge control system for a rechargeable power source comprising first and second input terminals each adapted for connection to a source of charging power, first circuit means for feeding power from said first input terminal to a first terminal of the rechargeable power source, second circuit means for feeding power from said second input terminal to a second terminal of the rechargeable power source, switch means for sending at least one condition of said rechargeable power source and for interrupting said first circuit means for feeding power in response thereto, third circuit means for feeding power from said rechargeable power source to said first input terminal, said third means including means for bypassing at least a portion of said switch means for interrupting said first circuit means for feeding power; said switch means including a pressure switch connected with said rechargeable power source and having contacts in series with said first circuit means, said switch means being responsive to said pressure exceeding a predetermined value to open said contacts; said means for bypassing including a power diode bypassing said switch contacts for power fed from said rechargeable power source to at least one of said input terminals; and a thermostat having contacts in series with said first circuit means for feeding power, said thermostat being operative to



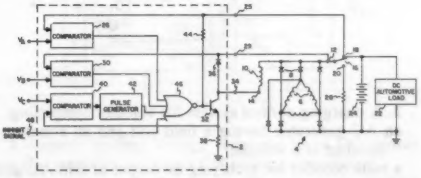
close said contacts above a predetermined temperature and to open said contacts below said predetermined temperature, and a resistor in parallel with said thermostat contacts, whereby said resistor is placed in series with said first circuit means for feeding power below said predetermined temperature, and said means for bypassing is effective for bypassing said thermostat contacts and said resistor for feeding power from said rechargeable power source to said first input terminal.

4,346,337

VOLTAGE REGULATOR CIRCUIT WITH MULTIPLE CONTROL FUNCTIONS

Donald L. Watrous, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,179
Int. Cl.³ H02P 9/30
U.S. Cl. 322—25 **5 Claims**



1. A voltage regulator circuit for providing regulation of an electric alternator, said alternator having an output terminal for supplying energy to a load circuit and having a field winding terminal, said regulator circuit comprising:

a control device coupled to said field winding terminal for controlling the field current of said alternator;

first means responsive to the voltage across said load circuit for causing application of a first control signal to said current control device for regulating said alternator voltage at said output terminal to within a predetermined voltage level;

second means responsive to said field current for causing application of a second control signal to said current control device for limiting the field current to a predetermined current level giving rise to an alternating voltage at said output terminal of a level that is less than said predetermined voltage level whereby said first means is enabled in one operation of said regulator circuit as a function of load voltage and said second means is enabled in a further

operation of said regulator circuit as a function of field current;

said second means including sensing means for generating a first sensing signal that is proportional to said field current, and comparison means for comparing a field current reference signal with said sensing signal so as to supply said second control signal when said sensing signal exceeds said reference signal; and

an OR network coupling the output of each of said first and second means to said current control device such that said first and second control signals can reach said current control device,

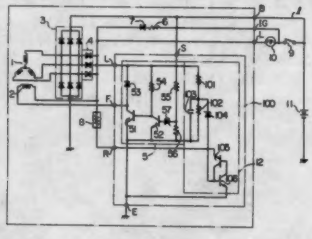
said comparison means including a pulse generating network whose output is employed to supply said second control signal to the input of said current control device, and a comparator network the output of which is coupled to said pulse generating network, said comparator network providing an enabling output for triggering said pulse generating network upon said sensing signal exceeding said reference signal and supplying said second control signal as a pulsed signal.

4,346,338

BATTERY CHARGING CONTROL SYSTEM FOR VEHICLES

Takeshi Nakamoto, Ohbu; Katsutaro Iwaki, Chiryu; Katsuya Muto, Kariya; Katsumi Itoh, Ohbu, and Yoshio Akita, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 26, 1980, Ser. No. 191,816
Claims priority, application Japan, Sep. 28, 1979, 54/126220
Int. Cl.³ H02J 7/14
U.S. Cl. 322—28 **4 Claims**



1. A charging control system for vehicles comprising:

an AC generator having a field coil and an armature coil installed in a vehicle;

a main rectifier for rectifying an output of said AC generator;

an auxiliary rectifier for rectifying an output of said AC generator;

a battery connected to an output terminal of said main rectifier through a charging line and to an output terminal of said auxiliary rectifier through both a key switch and a parallel circuit including indicator means and an initial excitation resistor;

a voltage regulator for energizing said field coil of said generator so as to control the generation of power by said generator;

an energization resistor connected to the output terminal of said auxiliary rectifier; and

an energization control circuit disposed such that an energization path is established between the output terminal of said auxiliary rectifier and a ground through said energization resistor only when the generated voltage of said generator is within a predetermined range, said energization control circuit including:

a voltage detecting circuit for receiving a voltage generated at the output terminal of said auxiliary rectifier and for detecting that said input voltage has reached a first predetermined value;

delay means for delaying the voltage to said voltage detecting circuit; and

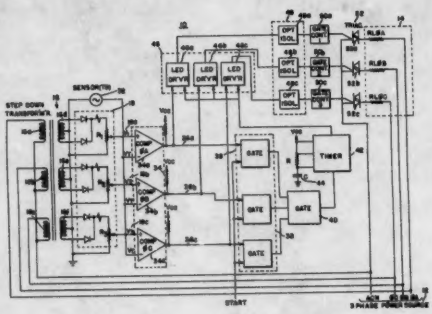
a hold circuit responsive to a detection signal from said voltage detecting circuit for performing a self-holding operation and for establishing an energization path through said energization resistor.

4,346,339

APPARATUS FOR AUTOMATIC REGULATION OF AC POWER

Walter S. Lewandowski, Collegeville, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,936
Int. Cl.³ G05F 1/455
U.S. Cl. 323—245 **2 Claims**



1. A closed loop phase control system for controlling an amount of power delivered to a load on a multi-phase power line comprising:

a multi-phase power source means connected to said load by a plurality of power lines for providing an AC current flow through said load, each of said power lines associated with a different phase line voltage;

reference voltage means connected to said plurality of power lines for sensing and rectifying each of said different phase AC line voltages whereby a cyclic rectified reference voltage is generated from each of said different phase AC line voltages;

parameter sensing means for sensing the value of a predetermined parameter of said load that is sensitive to said current flow and developing a sensor voltage signal indicative of said value;

comparator means connected to said reference voltage means for comparing each of the reference voltages associated with one of said power lines with said sensor voltage signal and developing a trigger signal when one of said reference signals is greater than or substantially equal to said sensor voltage signal;

first circuitry means for generating a switching pulse of a predetermined pulse width in response to each of said trigger signals from said comparator means and for transmitting said pulse along one of a plurality of gating lines corresponding to one of said plurality of power lines, said first circuitry means further comprising: a single switching pulse generating circuit coupled to said comparator means; and selection circuit means coupled to said comparator means and to said single switching pulse generating circuit for automatically selecting one of said plurality of gating lines corresponding to one of said plurality of power lines associated with said trigger signal along which selected gating line said switching pulse is transmitted; and

a plurality of triac means connected to said load correspond-

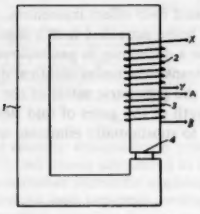
ing to said plurality of power lines and connected to said plurality of gating lines such that one triac means is connected at only one gating line, each of said triac means for conducting said AC current flow through said load in response to said switching pulse until said AC current flow associated with a corresponding voltage line passes through zero.

4,346,340

METHOD AND MEANS FOR CONTROLLING THE FLUX DENSITY IN THE CORE OF AN INDUCTOR

Francis C. Hackett-Jones, "Seymour", Wouldham, Kent, England

Filed Apr. 30, 1980, Ser. No. 145,264
Int. Cl.³ G05F 5/00
U.S. Cl. 323—249 8 Claims



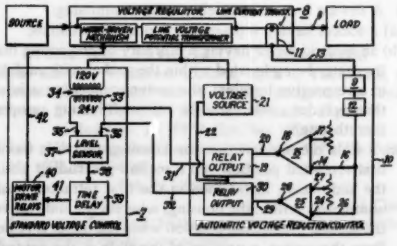
1. A method of controlling the flux density within the core of an inductor which has applied to a winding thereof a first A.C. component of current and a second component of current which is D.C. or A.C. of a lower frequency than the first, comprising the steps of detecting the said second component of current and applying to a control winding of the inductor a control current in order to produce in the said core a magnetic flux tending to balance the magnetic flux generated by said second component of current, whereby saturation of the core of said inductor occurs at a greater amplitude of said first A.C. component of current than would be the case in the absence of said control current.

4,346,341

METHOD AND APPARATUS FOR AUTOMATIC VOLTAGE REDUCTION CONTROL

Richard D. Blackburn, and Donald A. Duclos, both of Pittsfield, Mass., assignors to General Electric Company

Filed Mar. 2, 1981, Ser. No. 239,696
Int. Cl.³ G05F 1/14
U.S. Cl. 323—257 2 Claims



1. A voltage reduction control circuit for utilization in conjunction with a conventional voltage regulator normally operating to regulate the line voltage in a power distribution circuit, wherein said voltage regulator includes a potential transformer having a primary connected with the distribution circuit and a secondary in which is developed a voltage signal indicative of the line voltage, and a motor-driven mechanism operating to effect incremental reductions in the line voltage in response to increases in said control voltage and incremental increases in the line voltage in response to decreases in said control voltage, said voltage reduction control circuit including, in combination:

a current transformer linked with the distribution circuit for developing a first signal indicative of the load current flowing therein;

means for monitoring said first signal with respect to a reference signal indicative of a predetermined peak load current level, said monitoring means generating an output signal when said first signal exceeds said reference signal;

a voltage source; and

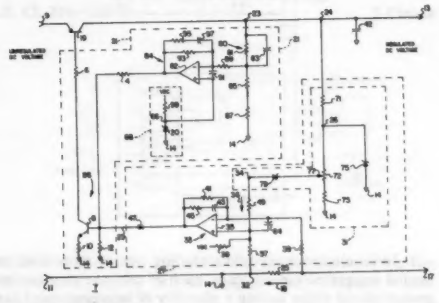
switching means connected in circuit between said voltage source and the potential transformer secondary of the voltage regulator, said switching means operating in response to said output signal to connect said voltage source in circuit with the potential transformer secondary and thus effect a step voltage increase in said voltage signal, whereby the motor-driven mechanism responds as though to a high line voltage condition by effecting a reduction in the line voltage to thereby decrease the load current to a level below said predetermined peak load current level.

4,346,342

CURRENT LIMITING VOLTAGE REGULATOR

James A. Carollo, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 9, 1981, Ser. No. 271,768
Int. Cl.³ G05F 1/44
U.S. Cl. 323—276 7 Claims



1. A current limiting voltage regulator for a DC power supply that provides an output DC voltage comprising:

a current sensor means for sensing the current provided by the DC power supply to obtain a sensed current signal;

a threshold generator means for generating a dynamic current threshold reference signal;

a detector means for detecting when the sensed current signals exceed the dynamic current threshold reference signal and if detected to provide a voltage override signal according to a preselected function;

voltage control means for controlling the output DC voltage and in response to the voltage override signal adjusts the output DC voltage to limit the current flow from the DC power supply; and

the first threshold generator means includes; a first threshold generator means for generating a first preselected threshold that is a first stage of the dynamic current threshold reference signal and when exceeded by the sensed current signal will cause the detector means to provide the voltage override signal of a first magnitude that will cause the voltage control circuit to reduce the DC output voltage to a first preselected output voltage, and a second threshold generator means for generating a second preselected

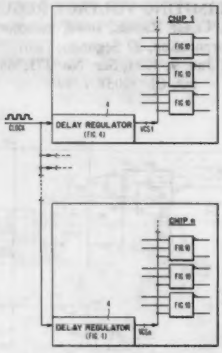
threshold that is a second stage of the dynamic threshold reference signal and when exceeded by the sensed current signal at the first preselected output voltage will cause the detector means to provide the voltage override signal of a second magnitude that will cause the voltage control circuit to reduce the DC output voltage to a second preselected output voltage, and a third threshold generator means for generating a third preselected threshold that is a third stage of the dynamic threshold reference signal and when exceeded by the sensed current signal at the second preselected voltage will cause the detector means to provide the voltage override signal of a third magnitude that will cause the voltage control circuit to reduce the DC output voltage to a third preselected voltage.

4,346,343

POWER CONTROL MEANS FOR ELIMINATING CIRCUIT TO CIRCUIT DELAY DIFFERENCES AND PROVIDING A DESIRED CIRCUIT DELAY

Erich Berndlmaier; Jack A. Dorler, both of Wappingers Falls; Joseph M. Mosley, Hopewell Junction, and Stephen D. Weitzel, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 16, 1980, Ser. No. 150,762
Int. Cl.³ G05F *1/46*
U.S. Cl. 323—282 **27 Claims**



1. In an electronic system including one or more interconnected integrated circuit chips, each of said one or more integrated circuit chips having a plurality of interconnected logic circuits thereon, each of said logic circuits having a gate delay versus power curve, said system being characterized by the inclusion of power control means for regulating the power to each of said one or more chips whereby the power provided to said logic circuits on said one or more integrated circuit chips may vary chip to chip but said gate delay of said logic circuits on each of said one or more integrated circuit chips will be essentially equal one to another.

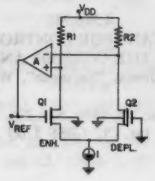
4,346,344

STABLE FIELD EFFECT TRANSISTOR VOLTAGE REFERENCE

Robert A. Blauschild, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 8, 1979, Ser. No. 10,195
Int. Cl.³ G05F *3/08*
U.S. Cl. 323—313 **5 Claims**

1. A stable voltage reference comprising an enhancement field effect transistor, a depletion field effect transistor, a separate means connected in series with the drain-source terminals of each of said field effect transistors for limiting the flow of current therethrough, a differential amplifier provided with a first input connected between the enhancement field effect transistor and the current limiting means connected thereto and provided with a second input connected between the depletion field effect transistor and the current limiting means connected thereto, means connecting the gate of one of said field effect transistors to a reference potential, and means connecting the output of said differential amplifier to the gate



of the other of said field effect transistors, said depletion field effect transistor being provided with a depletion implant sufficient to generate a difference in gate-source voltages between said field effect transistors under identical drain-source current conditions, and the geometric ratios of the width of the channels and the length of the gates of said field effect transistors being sufficient to substantially eliminate temperature drift.

4,346,345

THEFT RESISTING DEVICE

Ronald C. Welz, Cerritos, Calif., assignor to Southern California Edison Company, Rosemead, Calif.

Filed Apr. 25, 1980, Ser. No. 143,741
Int. Cl.³ G01R *11/24*; H01R *13/00*
U.S. Cl. 324—110 **13 Claims**

1. A device for metering electricity comprising:
(a) a socket having a plurality of electric terminals;
(b) an electric meter having a plurality of projecting blades, the meter being located within the socket with each blade in a respective terminal, the meter comprising a housing that includes a side wall, the side wall having an opening therethrough;
(c) a slide mounted within the housing, the slide having a first retracted position and a second protruding position, the slide being maintained in the first retracted position completely within the housing, wherein the slide moves to the second protruding position when the meter is removed from the socket, a portion of the slide in the protruding position extending through the opening in the side wall of the housing and preventing relocation of the meter in the socket; and
(d) locking means within the housing preventing the slide from moving from the protruding position to the retracted position.

4,346,346

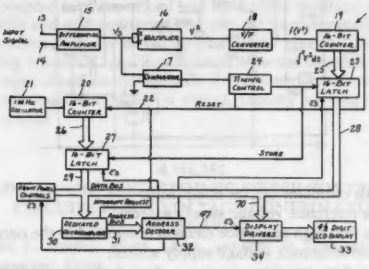
INSTRUMENT FOR MEASURING TRUE-RMS A.C. VOLTAGE AND A.C. VOLTAGE FLUCTUATIONS

Jeffrey L. Silberberg, Rockville, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 5, 1980, Ser. No. 118,969

Int. Cl.³ G01R *15/10, 19/02*

U.S. Cl. 324—132 **16 Claims**



1. A line voltage monitor comprising a pair of input terminals, analog input circuit means connected to said input terminals and including multiplier means for squaring an input signal voltage V(t) applied to said terminals, voltage-to-frequency converter means producing logic pulses at a rate proportional to the square of said signal voltage, $V^2(t)$, first counter means for integrating the pulses to derive a pulse accumulation representing the integral of said squared signal voltage, over n cycles

$$\int_0^{nT} V^2(t)\,dt,$$

where n is an integer equal to or greater than 1, second counter means for determining the cycle period T of the input signal, computer means to divide said pulse accumulation by n times said cycle period to derive the RMS value

$$\left[\frac{1}{nT}\int_0^{nT} V^2(t)dt\right]^{\frac{1}{2}}$$

of said input signal voltage, V(t) and means to display said derived RMS value; whereby by making n equal to 1, said derived RMS value is based on each individual cycle of said input signal voltage.

4,346,347

DIODE FAULTS DETECTING APPARATUS

Shohichi Kamata; Yoshinori Kimura, both of Yokohama, and Katsumi Hirai, Inagi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 26, 1979, Ser. No. 97,494

Claims priority, application Japan, Dec. 15, 1978, 53-154640; Dec. 15, 1978, 53-154648

Int. Cl.³ G01R *31/22*

U.S. Cl. 324—158 D **2 Claims**

1. Apparatus for fault testing at least two diodes without using a reference diode, comprising:

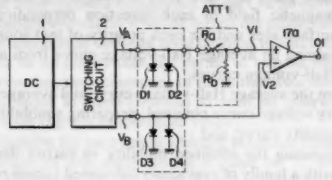
a direct current power supply;

at least first and second diodes to be fault detected, formed on the same substrate;

means for independently biasing said first and second diodes with power from said direct current power supply;

an attenuator, connected to a first polarity terminal of said first diode, to produce an attenuator output voltage having a level lower than a voltage level on said first polarity terminal of said first diode; and

a comparator having a first input coupled to the output of said attenuator and a second input coupled to a first polarity terminal of said second diode, to produce a logic level comparison output signal indicating whether or not the attenuator output voltage is higher than that of the first polarity terminal of the second diode, thereby indicating whether one of said diodes is faulty.



4,346,348

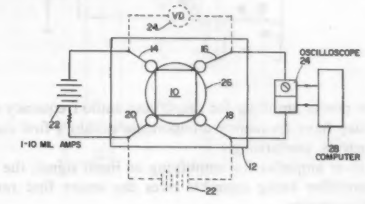
LASER TECHNIQUE FOR ACCURATELY DETERMINING THE COMPENSATION DENSITY IN N-TYPE NARROW GAP SEMICONDUCTOR

Filbert J. Bartoli, Upper Marlboro, and Jerry R. Meyer, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1980, Ser. No. 125,427

Int. Cl.³ G01R *31/26, 27/02*

U.S. Cl. 324—158 R **5 Claims**



1. A nondestructive optical technique for determining the compensation density of narrow-gap semiconductors which comprises the steps of:

fabricating a sample of n-type, narrow-gap semiconductive material on an electrically nonconductive substrate to include electrical contacts at the corners of the semiconductor material;

cooling said semiconductor sample;

directing uniformly over the surface area of said semiconductor sample a laser pulse of such a wavelength that the photon energy is less than the band gap of the sample but greater than ½ of the band gap with a power density such that carries are generated uniformly throughout the volume of the sample;

applying a steady D.C. voltage to adjacent contacts on said sample;

measuring and recording the conductivity voltage for a given combination of electrical contacts of said sample;

repeating the above conductivity voltage measurements for each combination of electrical contacts and voltage source polarity and obtaining an average conductivity voltage curve for all data obtained;

directing a magnetic field perpendicularly to the surface area of said sample;

directing uniformly over the surface area of said semiconductor sample a laser pulse of such a wavelength that the

photon energy is less than the band gap of the sample but greater than ½ the band gap with a power density such that carriers are generated uniformly throughout the volume of said sample;

measuring and recording the Hall-voltages after peak of the laser pulse for each pair of electrical contacts with the magnetic field in each direction perpendicular to the surface area and for each polarity of said source;

obtaining an average Hall-voltage curve from all recorded Hall-voltage curves;

from the average Hall-voltage curve and average conductivity voltage curve obtained, preparing a mobility vs carrier density curve; and

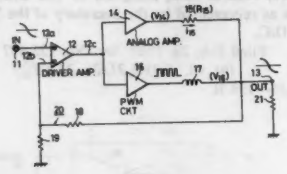
comparing the obtained mobility vs carrier density curve with a family of previously calculated curves representing different compensation densities, thereby determining the compensation density by obtaining a match, and hence designating the quality of the material of the sample.

4,346,349

MULTI-CHANNEL AUDIO POWER AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 7, 1980, Ser. No. 147,502
Claims priority, application Japan, May 10, 1979, 54-57464
Int. Cl.³ H03F *3/38, 3/68*
U.S. Cl. 330—10 **7 Claims**



1. A power amplifier for amplifying audio frequency signals that may have frequency components within a first range of frequencies, comprising:

a driver amplifier for amplifying an input signal, the driver amplifier being operable over the entire first range of frequencies,

a high frequency analog power amplifying circuit having an input coupled to the driver amplifier for power-amplifying with a substantially flat gain components of an output signal from the driver amplifier that are within a second range of frequencies within the first range;

a low frequency pulse modulation and demodulation circuit having an input coupled to the driver amplifier for power-amplifying components of an output signal from the driver that are within a third range of frequencies within the first range, the first range including at least one frequency that is lower than any frequency in the second range, the pulse modulation and demodulation circuit comprising a pulse width modulator operating at a predetermined carrier frequency and an inductor coil acting as a low pass filter having a cut-off frequency lower than that of the carrier;

an output terminal for delivering an output signal of the power amplifier including signals from both the high frequency analog amplifier and the low frequency pulse circuit;

a resistor having an impedance higher than that of the low pass filter of the pulse modulation and demodulating circuit for frequencies in the third range coupling an output of the high frequency analog power amplifying circuit to the output terminal; and

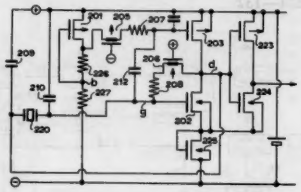
a negative feedback circuit providing a negative feedback from the output terminal to the driver amplifier.

4,346,350

FET QUARTZ OSCILLATORS

Shigeru Morokawa, and Ryoji Iwakura, both of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1980, Ser. No. 116,615
Claims priority, application Japan, Feb. 16, 1979, 54-16981
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—116 FE **8 Claims**



1. An oscillator circuit comprising

(a) a reference voltage supply source;

(b) a first high resistance element connected to the output of said reference voltage supply source;

(c) a first transistor having a first drain electrode and a control gate electrode, said control gate electrode being connected through said first high resistance element to said reference voltage supply source;

(d) a second transistor having a second control gate electrode and a second drain electrode, said second drain electrode connected to said drain electrode of said first transistor and having a conduction type different from that of said first transistor;

(e) a second high resistance element connected between said second control gate electrode and the drain electrode of said second transistor;

(f) a first condenser coupling the control gate electrodes of said first and second transistors such that said first and second transistors form an inversion amplifier circuit;

(g) a quartz resonator circuit connected between the second control gate electrode of said inversion amplifier circuit and the first drain electrode thereof; and

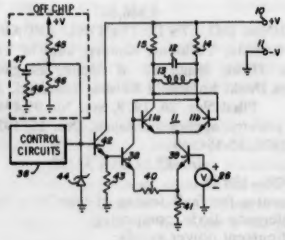
(h) an electric supply source connected between a third electrode of said first and second transistors.

4,346,351

HIGH FREQUENCY VOLTAGE-CONTROLLED OSCILLATOR

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 28, 1980, Ser. No. 125,606
Int. Cl.³ H03B *5/12*
U.S. Cl. 331—117 R **8 Claims**



1. A voltage controlled oscillator circuit comprising:

differential oscillator means including a pair of differentially connected transistors, a pair of load resistors coupled between one terminal of a source of supply voltage and

the collectors of said pair of transistors, direct cross connections between the base-collector circuits of said pair of transistors and a tuned antiresonant circuit coupled between said collectors;

a current source transistor having its base returned to a constant potential, its emitter returned by means of a resistor to the other terminal of said source of supply voltage and a collector coupled to said oscillator means; and

a shunting transistor having its emitter-collector circuit coupled between one of said differential oscillator collectors and said emitter of said current source transistor, an emitter follower driver coupled to the base of said shunting transistor, and control signal means coupled to the input of said emitter follower driver whereby the curent in said oscillator means is varied, thereby varying its frequency.

4,346,352

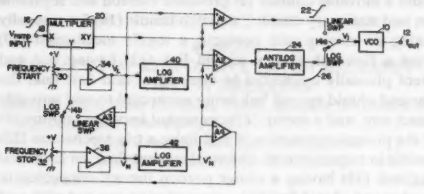
LINEAR AND LOGARITHMIC SWEEP CONTROL CIRCUITS FOR A VOLTAGE-CONTROLLED OSCILLATOR

Robert E. Baetke, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 30, 1980, Ser. No. 192,279

Int. Cl.³ H03C *23/00*

U.S. Cl. 331—178 **8 Claims**



1. A sweep control circuit for a voltage-controlled oscillator, comprising:

a linear circuit path and a non-linear circuit path driven by a common ramp voltage to provide respectively a linear sweep signal and a non-linear sweep signal which are selectively connectable to said voltage-controlled oscillator;

means for generating independent first start and stop voltages;

means for converting said first start and stop voltages to second start and stop voltages which are related to said first voltages in accordance with a non-linear function determined by said non-linear circuit path; and

means for combining said first start and stop voltages with said ramp voltage to form said linear sweep signal, and for combining said second start and stop voltages with said ramp voltage to form said non-linear sweep signal.

4,346,353

MODULATOR AND DEMODULATOR CIRCUITS FOR MODIFIED DELAY MODULATION METHOD

Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,127

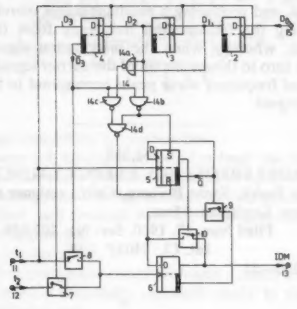
Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922082

Int. Cl.³ H03K *7/10, 9/10*

U.S. Cl. 332—9 R **12 Claims**

1. In a method for converting a binary sequence composed of a succession of bits, each having a value of "1" or "0", occurring in successive bit intervals, into a transmitted signal containing a representation of each bit, by representing a bit of one value as a change in the level of the transmitted signal at a time corresponding to the middle of the associated bit interval, and representing a bit of the other value as a change in the level of the transmitted signal at a time corresponding to the end of the associated bit interval if a further bit of the other value follows, the improvement comprising in part suppressing signal level changes associated with the bits of the other value for causing the time period between level changes in said transmitted signal to be no longer than the period of two bit intervals and for preventing the occurrence of more than two consecutive level changes at intervals equal to each bit interval and associated with the bits of the other value.

6. Demodulator for recovering a binary sequence composed of a succession of bits, each having a value of "1" or "0", occurring in successive bit intervals, from a transmitted signal containing a representation of each bit in that a bit of one value is represented as a change in the level of the transmitted signal at a time corresponding to the middle of the associated bit interval, a bit of the other value is represented as a change in the level of the transmitted signal at a time corresponding to the end of the associated bit interval if a further bit of the other value follows, transmitted signal level changes associated with bits of the other value are in part suppressed to cause the time

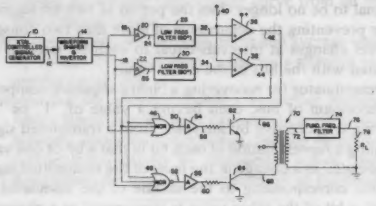


period between level changes in said transmitted signal to be no longer than the period of two bit intervals, and the occurrence of more than two consecutive level changes at intervals equal to each bit interval and associated with the bits of the other value is prevented, said demodulator comprising: pulse forming means connected for forming a pulse in response to each level change of the transmitted signal; pulse regenerating means connected to receive the pulses formed by said pulse forming means for generating a train of pulses having a repetition rate equal to twice the repetition rate of the binary sequence; switching voltage generator means connected to receive the pulses produced by said regenerating means for generating two periodic switching voltages differing from one another in phase by 180° and each having a repetition rate equal to that of the binary sequence; gating means connected to receive the pulses formed by said pulse forming means and the switching voltages for utilizing the switching voltages as gating signals and for producing signals representative of the time relation between the pulses formed by said pulse forming means and each of the switching voltages; and an identification circuit connected to receive signals produced by said gating means for producing a signal identifying the switching voltage associated in phase with at least three consecutive transmitted signal level changes at intervals equal to each bit interval.

4,346,354
AMPLITUDE MODULATOR USING VARIABLE WIDTH RECTANGULAR PULSE GENERATOR

George D. Hanna, Dallas, Tex., assignor to Continental Electronics, Inc., Dallas, Tex.

Filed Sep. 29, 1980, Ser. No. 191,898
Int. Cl.³ H03C 1/02, 1/50
U.S. Cl. 332—43 B 11 Claims



11. A method for impressing an information signal on a carrier signal, comprising the steps of;

producing pulses when the carrier signal amplitude is greater than the information signal amplitude;

causing said pulses to be produced at times corresponding to zero and π radians on the time continuum of the carrier signal;

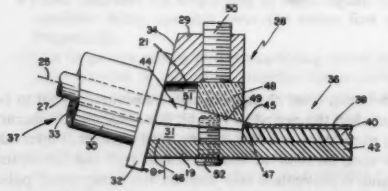
inverting every other consecutive pulse of said produced signal, and producing a resultant signal therefrom;

extracting the fundamental frequency from the resultant signal, whereby when the information signal is varied from zero to the maximum of the carrier signal, the fundamental frequency wave peaks correspond to the information signal.

4,346,355
RADIO FREQUENCY ENERGY LAUNCHER

Toshikazu Tsukii, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 17, 1980, Ser. No. 207,559
Int. Cl.³ H01P 5/08
U.S. Cl. 333—33 8 Claims



1. A radio frequency energy launcher for transferring such energy between a coaxial transmission line having inner and outer spaced, coaxial conductors and a microstrip transmission line having a dielectric substrate, a strip conductor disposed on a surface of the substrate and a ground plane separated from the strip conductor by the dielectric substrate comprising:

a conductive housing having a wall structure providing a passageway forming an outer conductor and a spaced inner conductor extending within said passageway to electrically interconnect said inner conductor of said coaxial transmission line and said strip conductor of said microstrip transmission line;

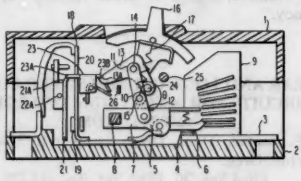
means for exerting a mounting force between the inner conductor of the coaxial transmission line and the strip conductor of the microstrip transmission line such force having a component normal to the surface of the dielectric substrate; and

wherein the launcher inner conductor is disposed at an oblique angle relative to the surface of said dielectric substrate.

4,346,356
CIRCUIT BREAKER WITH INCREASED CONTACT SEPARATION

Kohei Fujiwara, and Setsuo Hosogai, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,234
Claims priority, application Japan, Feb. 19, 1980, 55-19866[U]
Int. Cl.³ H01H 75/00, 77/00, 83/00
U.S. Cl. 335—6 5 Claims



*. In a circuit breaker including a stationary contact (4) a movable contact assembly (5) having a movable contact arm (7) and a movable contact (6) provided thereon and separable from said stationary contact; a switch handle (16) for manually opening or closing said contacts; a toggle mechanism (10) having a first link (11), a second link (12) having one end thereof pivotally connected to one end of said first link, the other end of said second link being connected to said movable contact arm, and a spring (17) connected between said handle and the pivotal connection of said links; a trip mechanism (23) operable in response to an abnormal current flow; an L-shaped bell crank (13) having a center portion thereof connected to the other end of said first link, engaged at its one end with said trip mechanism when said contacts are closed, and rotatable around a shaft (24) at its other end by the spring induced pivoting of said toggle mechanism links to separate said contacts when the crank is disengaged from said trip mechanism; the improvements characterized by:

(a) a fixed stop member (26) disposed in a path of movement of said toggle mechanism for direct abutment thereby to limit the degree of pivoting between said first and second links, and thereby the separation distance between the contacts, during manual contact separation, and

(b) said shaft, against which the movable contact arm strikes during automatic contact separation, being disposed sufficiently far from said contact arm in its manually opened position to enable a greater separation distance between the contacts during automatic operation by said trip mechanism than during manual operation by said switch handle.

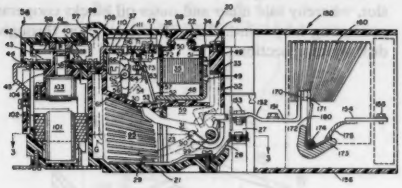
4,346,357
CURRENT-LIMITING CIRCUIT BREAKER ADAPTER

Frank W. Kussy, Randallstown; Gustave E. Heberlein, Jr., Sykesville, both of Md., and Bernard DiMarco, Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 17, 1979, Ser. No. 104,621
Int. Cl.³ H01H 77/10
U.S. Cl. 335—16 6 Claims

1. A current-limiting circuit breaker assembly comprising, in combination: a first circuit breaker having a first pair of contacts, a first arc interruption chamber associated with said first pair of contacts, a contact operating mechanism having a manual operating mechanism connected to said first pair of contacts and automatic trip means connected to said first pair

of contacts to open said first pair of contacts in response to a fault current, said first pair of contacts being disposed to have oppositely directed current paths of substantial length to produce a magnetic blow open force on said first pair of contacts to cause them to open independently of said contact operation mechanism, and a second circuit breaker comprising a second pair of contacts connected in series with said first pair of contacts, a second arc interruption chamber associated with



said second pair of contacts and biasing means connected to said second pair of contacts to normally close said second pair of contacts; said second pair of contacts being disposed to have oppositely directed current paths of substantial length to produce a magnetic blow open force to open said second pair of contacts against the force of said biasing means when the current through said second pair of contacts exceeds a given value; said circuit breaker assembly being contained in a common housing.

4,346,358

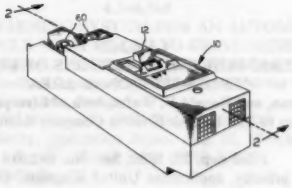
CONTACT POP RESPONSIVE LATCH RELEASE FOR CIRCUIT BREAKERS

Eldon B. Heft, West Hartford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,496

Int. Cl.³ H01H *75/00, 75/12, 77/00*

U.S. Cl. 335—16 **6 Claims**



1. An improved circuit breaker of the type comprising, in combination:

at least one elongated, electrically conductive arm;

a movable contact affixed to one end of said arm;

a stationary contact;

an operating mechanism including

a one-piece, pivotally mounted trigger,

a pin pivotally mounting said arm intermediate its end, and

a spring exerting a moment in said arm about said pin

a trip mechanism including

a latch normally sustaining said trigger in a reset position to enable said operating mechanism to articulate said arm between an open position with said contacts in spaced relation and a closed position with said contacts in engaged relation, said spring moment exerting contact pressure on said engaging contacts, and

trip elements responsive to current of overcurrent proportions flowing through said engaging contacts for actuating said latch to release said trigger, whereupon said operating mechanism articulates said arm from its closed to its open position as said spring discharges;

the improvement which comprises:

a rigid extension provided at the other end of said arm, with said arm in its closed position, said extension disposing its termination in actuating relation with said latch, whereby pivotal movement of said arm about said pin in opposition to said spring moment, as motivated by the flow of high level fault currents through said contacts causes said extension to actuate said latch and release said trigger before said trip elements can react to the fault current.

4,346,359

RELAY

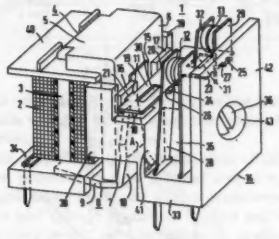
Paul Pirner, Altdorf, and Alois Muehling, Pleinfeld, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,718

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1980, 3002079

Int. Cl.³ H01H *45/02*

U.S. Cl. 335—202 **21 Claims**



1. A relay, comprising in combination:

an excitation coil having a core and at least one flange;

a U-shaped one-piece yoke comprising a covered yoke leg, a free yoke leg, and a bridge connecting said yoke legs with each other, said covered yoke leg serving as said core of said excitation coil;

a contact carrier unit;

a supporting bridge associated with said contact carrier unit and extending essentially perpendicularly to the axis of said excitation coil;

at least one switching contact having contact fingers, said contact fingers being positioned approximately parallel to the axis of said excitation coil and fastened with one end at said supporting bridge;

an angularly formed armature for operating said switching contact, said armature having an interacting armature leg for interacting with said core of said excitation coil, and a free armature leg not interacting with said core of said excitation coil, said interacting armature leg extending towards said core of said excitation coil, and said free armature leg extending essentially parallel to said free leg of said yoke and thereby covering a portion thereof, whereby said free armature leg is provided with a central recess, the end portion of said free armature leg thereby forming two armature operating fins;

a fastening piece associated with said supporting bridge, said fastening piece having an end face;

means for connecting said end face of said fastening piece to said free yoke leg at the location of said central recess provided between said fins in said free armature leg, thereby attaching said contact carrier unit to said yoke;

at least one supporting side arm provided on said contact carrier, said side arm extending from said contact carrier beyond said free yoke leg and supporting the inner face end of said flange of said excitation coil, whereby said flange supports with its outer face end said bridge connecting said two yoke legs;

a knife-edge bearing for supporting said armature, said knife-

edge bearing being formed by one edge of a face end of said free yoke leg; and

holding means for attaching said armature to said free leg of said yoke.

4,346,360

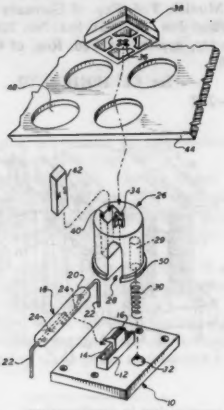
LOW PROFILE REED KEYSWITCH

Mark J. Del Tufo, Belleville, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed May 1, 1980, Ser. No. 145,512

Int. Cl.³ H01H *36/00*

U.S. Cl. 335—205 **7 Claims**



1. A low-profile reed keyswitch comprising:

a base;

a magnetically actuated reed switch having a longitudinal body and at least a pair of leads entering said body;

fixture means fastened to said base for supporting and retaining said reed switch independent of the leads with the longitudinal body of said reed switch substantially parallel to said base and with the leads of said reed switch passing freely through said base, said fixture means having a resilient clip thereon, the body of said reed switch being retained by said fixture means and said clip;

plunger means spaced apart from said reed switch and having a vertical slot therein, said plunger means being moveable in a straight line to a first position near said base and to a second position away from said base;

a spring for biasing said plunger means toward said second position away from said base; and

permanent magnet means carried in said vertical slot of said plunger for movement with said plunger means, said permanent magnet means being moved to a position to actuate said reed switch when said plunger is moved to said first position near said base.

4,346,361

COOLING DUCT ARRANGEMENT FOR TRANSFORMER WINDINGS

George E. Sauer, Stockbridge, Mass., assignor to General Electric Company, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,050

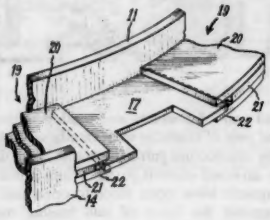
Int. Cl.³ H01F *27/10*

U.S. Cl. 336—60 **1 Claim**

1. A cooling duct arrangement for a transformer disk winding comprising, in combination:

a pair of inner and outer electrically insulating cylinders situated in a transformer tank containing dielectric oil for cooling and insulating a transformer disk winding arranged about a magnetic core and located between said inner and outer cylinders;

a plurality of inner and outer oil blocks alternatingly, radially disposed between disk winding sections, the outer edges of said outer oil blocks contacting the surface of said outer cylinder and the inner edges thereof terminating short of said inner cylinder, and the inner edges of said inner oil blocks contacting the surface of said inner cylinder, the outer edge of each said inner oil block having a slot, whereby said inner and outer oil blocks cooperate in promoting labywrinth flow of dielectric oil through the disk winding sections;



and

a pair of spacers associated with each said inner oil block, each said spacer pair contacting the surface of said inner cylinder and providing opposed, radially extending grooves for slidably receiving the lateral edges of its associated inner oil block, thereby accommodating positional adjustment of said inner oil blocks accasioned by shrinkage of said inner cylinder during a transformer drying process and thus avoid distrubance of the contacting relationship between said inner oil blocks and said inner cylinder.

4,346,362

ELECTRIC FUSES WITH REGIONS OF REDUCED CROSS-SECTIONAL AREA

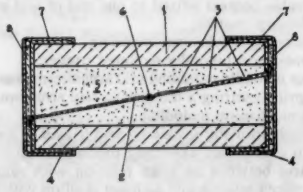
John Feenan, and Ronald V. Wafer, both of Liverpool, England, assignors to The English Electric Company Limited, London, England

Filed Sep. 29, 1980, Ser. No. 192,014

Claims priority, application United Kingdom, Oct. 10, 1979, 7935213

Int. Cl.³ H01H *85/02*

U.S. Cl. 337—248 **5 Claims**

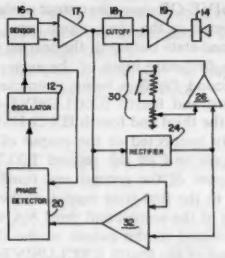


1. An electric fuse incorporating a tubular body of insulating material, metal end caps on the respective ends of the tubular body and an elongate fuse element having regions of reduced cross-sectional area and extending through the tubular body in electrical series between the metal end caps, wherein the fuse also incorporates within each end cap a respective gasket of an absorbent material impregnated with an arc-inhibiting substance.

4,346,363
ELECTRONIC CIRCUIT FOR SENSING DEVIATIONS IN PHYSICAL FORCES THEREON

Jack Wilhelmson, 244 Colony Ct., Bloomingdale, Ill. 60108

Filed Dec. 22, 1978, Ser. No. 972,297
Int. Cl.³ G08B 3/00
U.S. Cl. 340—27 R 5 Claims



1. An electronic sensor circuit for sensing deviations in direction and magnitude of physical forces thereon comprising:

input means for generating electrical input signals of selected predetermined frequencies;

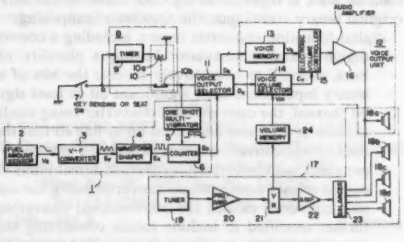
frequency selecting means electrically coupled to said input means for sensing a deviation in physical forces and selecting in response thereto a predetermined frequency corresponding to the direction of the deviation; and

amplitude control means electrically coupled to said frequency selecting means for receiving said selected frequencies and providing an amplitude controlled output of said selected frequencies corresponding to the magnitude of the deviation of the physical forces.

4,346,364
VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE WITH READY-TO-DRIVE SENSOR

Kazumasa Takagi, Yokohama, and Masakazu Tsunoda, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Aug. 28, 1980, Ser. No. 182,239
Claims priority, application Japan, Aug. 31, 1979, 54-110251
Int. Cl.³ B60Q 5/00; G08B 21/00
U.S. Cl. 340—52 D 14 Claims



1. A voice warning system for an automotive vehicle, which comprises:

(a) fuel amount sensing means for detecting the amount of remaining fuel;

(b) ready-to-drive sensing means for detecting that the driver is ready to drive;

(c) a voice output selector for selectively outputting a voice output designation signal in accordance with a signal from said fuel amount sensing means whenever the signal from said ready-to-drive sensing menas is input thereto;

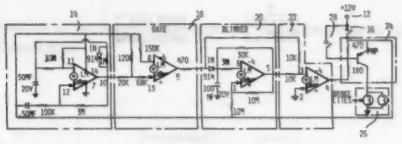
(d) a voice memory for storing necessary voice outputs and for outputting a series of voice signals V_s in accordance with the voice output designation signal D_s from said voice output selector,

whereby the amount of remaining fuel is informed to the driver in voice form whenever the driver is ready to drive.

4,346,365
STOPPED VEHICLE WARNING DEVICE

Charles E. Ingram, 2906 Orchard Ct., Highland, Mich. 48031

Filed Sep. 17, 1979, Ser. No. 75,894
Int. Cl.³ B60Q 1/44
U.S. Cl. 340—72 10 Claims



1. A stopped vehicle indicating device for use with a brake light on a vehicle which is lighted when the vehicle brakes are applied comprising:

timing means, responsive to the application of said vehicle brakes, for providing a time delayed output signal, said output signal being generated after a predetermined time delay after said vehicle brakes are applied and remaining present as long as said vehicle brakes are applied; and

flasher means, responsive to the presence of said output signal of said timing means, for flashing said brake light on and off, as long as said output signal is present;

said flasher means and said timing means being reset when said brakes are released.

4,346,366
SYSTEM FOR GENERATING AND MODIFYING DESIGNS FOR AUTOMATIC KNITTING MACHINERY AND THE LIKE

Toshihiro Kajiura, Osaka; Chiaki Masaki, Settsu, and Masahiro Mori, Osaka, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 916,469, Jun. 19, 1978, abandoned, which is a continuation of Ser. No. 565,119, Apr. 4, 1975, abandoned. This application Feb. 21, 1980, Ser. No. 123,461
Claims priority, application Japan, Apr. 9, 1974, 49-39446
Int. Cl.³ G06F 15/46
U.S. Cl. 340—146.3 R 7 Claims

1. A pattern generating and modifying system for producing signals representative of patterns to be knitted, comprising:

(a) input means adapted to be operated by a designer-operator,

(b) a programmable digital processing and controlling unit connected to said input means, said unit including

(i) means for producing signals representative of predetermined design motifs of said patterns,

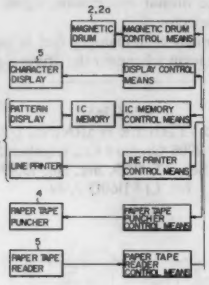
(ii) means for modifying said signals thereby to alter the dimensions, position, color and selected other characteristics of said motifs or patterns, and

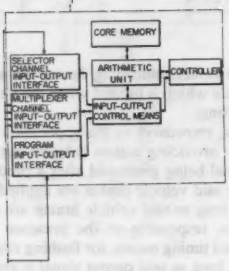
(iii) means for applying said signals or modified signals to output terminals,

(c) memory means associated with said processing unit which include a main canvas data storage area and sub-canvas data storage area,

(d) monitor means coupled to one of said output terminals for visually displaying the contents of said main and sub-canvas areas including said motifs or patterns which have been generated in response to said signals or modified signals,

said processing and controlling unit also including means to transfer data signals between said main and sub-canvas storage areas, means to control said monitor means, means





to control the application of said signals or modified signals to predetermined ones of said output terminals, and means to cooperate in controlling said input means.

4,346,367

CIRCUIT FOR CONVERTING BINARY DIGITAL SIGNALS INTO PSEUDOTERNARY A.C. PULSES

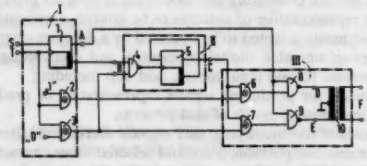
Walter Leinweber, Nuremberg, Fed. Rep. of Germany, assignor to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 92,945

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850129

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**



1. A circuit arrangement for converting a binary pulse train into a pseudoternary A.C. pulse train comprising in combination, first and second clocked flip-flips, each having a clock signal input, a first-state input, a first-state output, and a second-state output, first, second, third and fourth EXCLUSIVE-OR-gates each having an output and first and second inputs, first, second and third NAND-gates each having an output and first and second inputs, the first-state input of the first flip-flop being connected to receive the binary pulse train, the first inputs of the first and second EXCLUSIVE-OR-gates being connected to receive the same clock pulse train as the clock signal input of the first flip-flip, means constantly applying a "1" signal to the second input of the first EXCLUSIVE-OR-gate and constantly applying a "0" signal to the second input of the second EXCLUSIVE-OR-gate, the first NAND-gate having its first input connected to the second-state output of the first flip-flop and its second input to the output of the second EXCLUSIVE-OR-gate, the output of the first NAND-gate being connected to the clock signal input of the second flip-flop, the second-state output of the second flip-flop being connected to the first-state input of the same, the first-state output of the second flip-flop being connected to the first inputs of the third and fourth EXCLUSIVE-OR-gates, the second inputs of the third and fourth EXCLUSIVE-OR-gates being respectively connected to the output of the first EXCLUSIVE-OR-gate and of the second EXCLUSIVE-OR-gate, the first inputs of the second and third NAND-gates being connected to the first-state output of the first flip-flop, the second inputs of the second and third NAND-gates being respectively connected to the output of the third EXCLUSIVE-OR-gate and of the fourth EXCLUSIVE-OR-gate, and furthermore including a transformer having a primary winding connected between the outputs of the second and third NAND-gates.

4,346,368

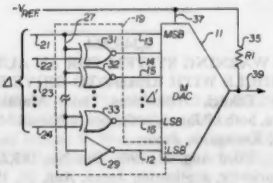
DIGITAL-TO-ANALOG CONVERTER CAPABLE OF PROCESSING A SIGN MAGNITUDE OR ONES COMPLEMENT BINARY CODED INPUT

Walter J. Johnson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 23, 1979, Ser. No. 96,901

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **8 Claims**



1. A digital-to-analog converter for processing an original binary code input in which a single analog reference numeral, such as zero, is represented by two different numbers in the original binary code input, the apparatus comprising:

digital-to-analog converter means, including a conventional digital-to-analog converter having a plurality of input lines, adapted to respectively receive the bits of a given binary input, from most significant bit to least significant bit thereof, the conventional converter being modified to include at least one additional input line so that the input lines of said converter means include the input lines of said conventional converter plus the additional input line, the output of said conventional converter being the output of said converter means, the conventional converter being further modified to include means connecting the additional input line in said conventional converter redundantly with equal weighting to the input line thereof adapted to receive the least significant bit; and

circuit means, having a plurality of inputs at least equal to the number of bits in the original code input and a plurality of outputs no greater than the number of input lines of said converter means, said circuit means being responsive to the original code input to produce a modified code input which has one more bit than the original code input and which, when applied to said converter means, results

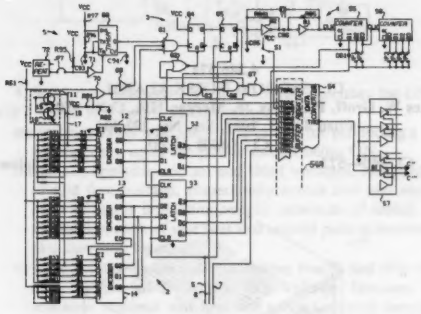
in an analog output which corresponds to the original code input, in which output said single analog reference numeral is produced in response to the two different numbers in the original binary code input.

4,346,369

KEYBOARD ENCODER-DECODER

Edward K. Macy, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1979, Ser. No. 80,594
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 S **13 Claims**



1. Apparatus for encoding comprising:

a keyboard comprising a plurality of keyboard switches;

parallel word generating means for generating a parallel format binary data word representative of only one actuated keyboard switch;

serial word generating means for receiving said parallel format binary data word and generating in response thereto a serial format binary data word; and

means for detecting that at least one and only one keyboard switch is actuated, said means for detecting having operably associated therewith

means for permitting receipt of said parallel format binary data word by said serial word generating means only when at least one and only one keyboard switch is actuated, and

means for permitting generation of said serial format binary data word to begin only when at least one and only one keyboard switch is actuated.

4,346,370

ULTRA-SONIC PEST CONTROL APPARATUS

Harry D. Carter, 5108 FM 1960 West, Houston, Tex. 77069, and Ted Ojevich, 5935 Moonmist, Houston, Tex. 77081

Filed Jun. 25, 1980, Ser. No. 162,763
Int. Cl.³ G08B *3/10*; A01M *29/00*
U.S. Cl. 340—384 E **6 Claims**

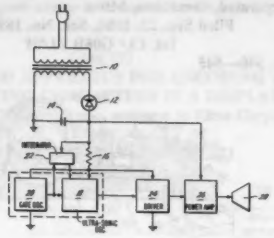
1. Ultra-sonic pest control apparatus, comprising:

(a) tone generating means for generating an output frequency as a function of applied voltage;

(b) a transducer electrically connected to the output of the tone generating means for delivering ultra-sonic sound;

(c) generating means for generating a periodically repeating sawtooth waveform; and

(d) gating means connected to the tone generating means and generating means for emitting a frequency sweep responsive to each sawtooth pattern of said sawtooth waveforms and uniformly chopping a portion of each frequency sweep and passing said chopped frequency



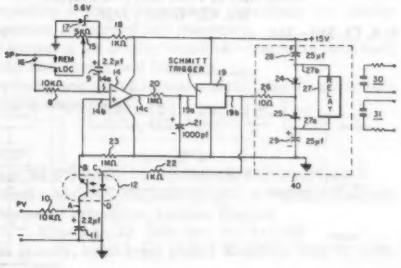
sweeps at predetermined, uniform, timed intervals to said transducer.

4,346,371

ALARM CIRCUIT

Edward S. Ida, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1980, Ser. No. 189,627
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—507 **3 Claims**

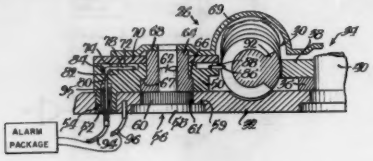


1. A fail-safe circuit for monitoring a signal that includes a load circuit having input terminals and a pulsating signal source for actuation thereof, said pulsating signal source comprising: an opto-isolator having emitter, collector and active photodiode terminals, the monitored signal being fed to said collector terminal, said collector terminal and said emitter terminal being operatively connected; a comparator having an inverting terminal, a noninverting terminal and an output terminal; a set point voltage source connected to the inverting terminal of the comparator; the noninverting terminal being connected to said emitter terminal of said opto-isolator; an oscillating Schmitt trigger circuit having input and output terminals; a signal delay circuit connecting the output terminal of the comparator with input terminal of the Schmitt trigger circuit, the output terminal of the Schmitt trigger circuit joining the input terminals of the load circuit to the active photodiode terminal of the opto-isolator whereby a failure mode will cause said Schmitt trigger to cease oscillating as a pulsating signal source, deactivating said load circuit.

4,346,372
WINDOW OPERATOR WITH SWITCH TO OPERATE A BURGLAR ALARM

Christopher T. Sandberg, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Sep. 22, 1980, Ser. No. 189,055
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—545 14 Claims



1. A window operator having means for generating an electric signal in response to operation of the window operator comprising:

a casing mountable on a window frame;

operator linkage means rotatably mounted within the casing and extending from said casing and connectable to a window sash;

rotatable means within said casing responsive to rotation of a handle and connected to said operator linkage means for causing rotation of the last mentioned means;

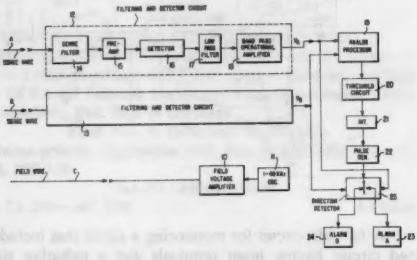
a circuit closing element positioned within said casing adjacent said rotatable means; and

said rotatable means having an irregular surface which intermittently engages said element for activation thereof.

4,346,373
INTRUSION WARNING SYSTEM UTILIZING A DIFFERENTIAL ELECTRIC FIELD

Gregory V. Hassman, 3126 Avis Way, Pinole, Calif. 94564

Filed Apr. 8, 1980, Ser. No. 138,404
Int. Cl.³ G08B *13/26*
U.S. Cl. 340—561 9 Claims



1. An intrusion warning system for protecting at least a portion of the perimeter of a given area comprising in combination:

means for producing a quasi-stationary electric field including a field wire insulated from ground and extending along the portion of the perimeter to be protected substantially parallel to ground, and an oscillator circuit having its output connected to said field wire and producing an output signal whose wavelength is very long compared to the length of said field wire;

first and second field sensing wires insulated from ground and extending along said portion of the perimeter substantially parallel to and vertically displaced from said field wire, said field sensing wires being disposed on opposite sides of said field wire and equidistantly spaced from said field wire and from ground;

first and second detector means, connected to said first and second sensing wires respectively, for detecting changes in the electric field sensed by said sense wires and for producing respective first and second electrical analog output signals corresponding to said changes;

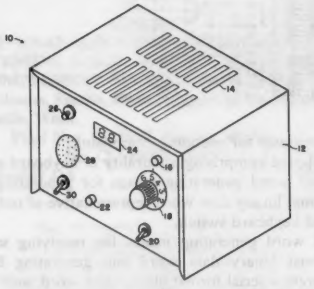
signal processing means for combining and multiplying said first and second electrical analog output signals and for producing an output signal whenever neither of said first and second electrical analog output signals is equal to zero and the difference between said first and second analog output signals is greater than a given value; and

alarm circuit means responsive to an output signal from said signal processing means for producing an alarm.

4,346,374
CLASSROOM NOISE ALARM

James W. Groff, P.O. Box 38, Morgan Hill, Calif. 95037

Filed Jan. 5, 1981, Ser. No. 222,304
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—573 4 Claims



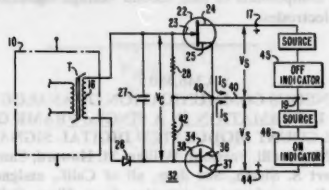
1. A classroom noise alarm for aiding the teacher in maintaining discipline comprising in combination: a power supply circuit for energizing said classroom noise alarm; a switch for actuating said power supply circuit of said classroom noise alarm; audible alarm means; a microphone for detecting noise occuring within a school classroom; an audio amplifier coupled with said microphone for amplifying the output thereof; adjustable resistance means coupled to the output of said audio amplifier for controlling the amplitude of an amplified noise signal; a sound-actuated switch coupled to the output of said adjustable resistance means and comprising an operatively associated audio input transformer, rectifieto the trigger of said second monostable multivibrator, the output thereof being connected to a second input terminal of said logic gate, thereby preventing said logic control signal of said sound-actuated switch from being conducted through said logic gate except during a predetermined time delay of said second monostable multivibrator occuring subsequent to a prior, predetermined time delay of said first monostable multivibrator for initiating actuation of said audible alarm means only after repeated classroom noise occuring within a specified timed interval; a second timing means, the trigger thereof being connected to the output of said logic gate of said first timing and control logic means and the output being connected to said audible alarm means for controlling actuation and duration of said audible alarm means; and counting and readout means operatively associated with said second timing means for counting and displaying the exact number of times said audible alarm means are actuated by classroom noise.

4,346,375

SOLID STATE STATUS INDICATION CIRCUIT FOR POWER CONTROLLERS

William W. Billings, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1980, Ser. No. 181,568
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—644 2 Claims



1. Solid state indication circuitry to indicate either the ON or OFF status of a power circuit comprising:

means associated with the power circuit for producing a first voltage only upon the power circuit being ON;

means for applying second and third voltages, independent of said first voltage, respectively across first and second pairs of status indicating output terminals of which one terminal of each of said first and second pairs is connected to a common terminal;

voltage divider means for establishing fourth and fifth voltages, developed from said first voltage, between said common terminal and first and second control terminals respectively of first and second respective semiconductive devices;

said first semiconductive device being a depletion mode field effect transistor having first and second terminals connected to said first pair of output terminals and conduction therebetween indicating an OFF state of the power circuit occurs upon said fourth voltage being at a low level; and

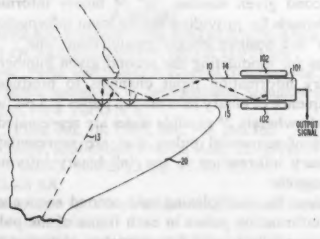
said second semiconductive device having first and second terminals connected to said second pair of output terminals and conduction therebetween indicating an ON state of the power circuit occurs upon said fifth voltage being at a high level.

4,346,376

TOUCH POSITION SENSITIVE SURFACE

James B. Mallos, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1980, Ser. No. 140,716
Int. Cl.[3] G08B 5/36
U.S. Cl. 340—712 22 Claims



1. A touch sensitive device for use in conjunction with a signal source, said device comprising

spaced apart surfaces arranged such that signals are introduced between said surfaces so as to become entrapped within said device by total internal reflection between said surfaces as a result of a touch of one of said surfaces, and

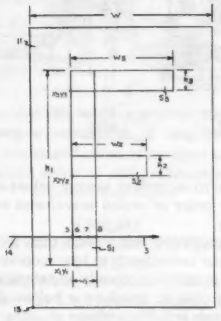
signal utilization means communicating with a region between said surfaces so as to provide a distinctive output when said signals are so introduced between said surfaces.

4,346,377

METHOD AND APPARATUS FOR ENCODING AND GENERATING CHARACTERS IN A DISPLAY

James A. Green, Wichita, Kans., assignor to Eltra Corporation, Morristown, N.J.

Filed May 30, 1980, Ser. No. 155,021
Int. Cl.[3] G06F 3/14
U.S. Cl. 340—731 14 Claims



1. A method of displaying reduced and expanded size characters in a photocomposition device comprising the steps of:

(a) encoding each of a set of normalized characters in a series of overlapping strokes, each stroke being a geometric shape and each stroke being encoded by start point coordinates and a first and second dimension of said stroke,

(b) encoding a set of instructions describing the display placement and size of said characters,

(c) determining the display locations coextensive with each stroke and storing said locations,

(d) accessing said stored locations for display of said strokes and said characters.

4,346,378

DOUBLE TRACE ELECTRO OPTIC DISPLAY

Ian A. Shanks, Malvern, England, assignor to National Research Development Corporation, London, England

Filed Apr. 23, 1980, Ser. No. 143,148
Claims priority, application United Kingdom, May 3, 1979, 7915425
Int. Cl.[3] G09G 3/36
U.S. Cl. 340—754 13 Claims

1. Apparatus for simultaneously displaying two waveform traces comprising:

(i) an electro optic display having a layer of display material between two dielectric substrates, a first series of m strip electrodes on one substrate and a second series of n strip electrodes on the other substrate arranged to define an m×n plurality of elements across which an electric signal may be applied to change the layer from one state to another thereby causing an observable display effect;

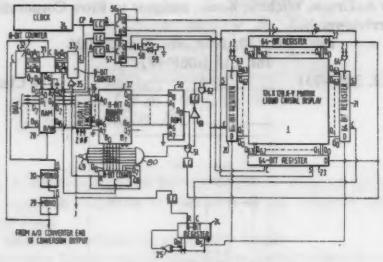
(ii) means for generating m different coded reference waveforms from different L-bit, N'-ary numbers whereby each waveform has a different shape over a period t, L and N' being integers greater than 1;

(iii) means for supplying a secondary voltage signal different from all the coded reference waveforms;

(iv) means for applying a different one of said coded reference waveforms to some of the first set of electrodes whilst applying said secondary voltage signal to the re-

mainder of the first set of electrodes so that all electrodes in the first set receive one of said coded waveforms and said secondary voltage signal in turn;

(v) means for selectively producing ones of the coded waveforms for application to the second set of electrodes simultaneously with coded waveform voltages applied to the first set of electrodes, the choice of such selectivity produced coded waveforms being related for each successive



n electrode to successive sample values of the two traces, and to the order of coded waveforms on the first set of electrodes;

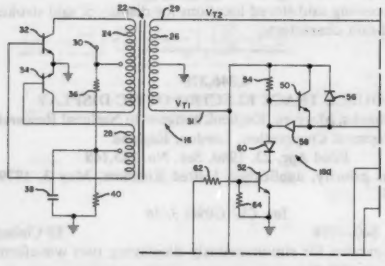
(vi) the arrangement being such that the two waveform traces appear collectively at intersections where the same waveform occurs periodically and simultaneously on both m, n electrodes to produce a below display threshold voltage level and the voltage at other intersections is above threshold level.

4,346,379

AC DRIVE SYSTEM FOR PLASMA DISPLAY PANELS

William G. Skaggs, and John L. Curry, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 12, 1980, Ser. No. 177,329
Int. Cl.³ G09G *3/28*
U.S. Cl. 340—778 **37 Claims**



1. A control system for driving a plasma display panel having a plurality of first electrodes extending in a first direction and a plurality of second electrodes extending in a second direction wherein said first electrodes are maintained in a spaced-apart relationship from said second electrodes to form a gas discharge cell at each point where one of said first electrodes crosses over one of said second electrodes, said control system comprising:

oscillator means for producing a first voltage signal, having an alternating sequence of positive and negative components respectively reaching a first predetermined positive voltage and a first predetermined negative voltage, and a second voltage signal, having an alternating sequence of positive and negative components respectively reaching a second predetermined positive voltage and a second predetermined negative voltage, wherein the positive components of said first voltage signal substantially coincide with the negative components of said second voltage signal and the negative components of said first voltage signal substantially coincide with the positive components of said second voltage signal;

first driver means for selectively applying the positive and negative components of said first voltage signal to said first electrodes; and

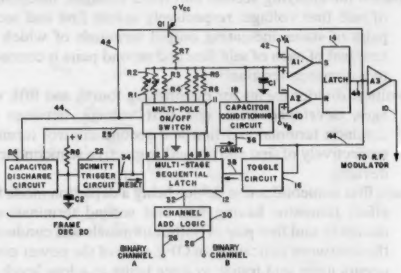
second driver means for selectively applying the positive and negative components of said second voltage signal to said second electrodes.

4,346,380

SIMULTANEOUS COMMUNICATION OF ANALOG AND BINARY INFORMATION IN A SINGLE FRAME OF A PULSE COUNT MODULATED DIGITAL SIGNAL

Dennis M. Monticelli, Fremont; William M. Howard, Campbell, and Robert S. Sleeth, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 968,174, Dec. 11, 1978, abandoned.
This application Apr. 15, 1980, Ser. No. 140,589
Int. Cl.³ H04J *3/00*
U.S. Cl. 340—825.63 **3 Claims**



1. A communications system for communicating both analog information and binary information in a single frame of a pulse train, comprising:

a first number "m" of analog information input channels for providing analog input information, wherein "m" is a positive integer greater than or equal to "one";

means for sequentially multiplexing and modulating the first given number "m" of analog information input channels to produce a first sequence of "m" analog information pulses in each frame of the pulse train, wherein each analog information pulse respectively has a width that is proportional to the amplitude of the analog information in the respective analog information input channel;

a second given number "n" of binary information input channels for providing binary input information, wherein "n" is a positive integer greater than "one";

means for modulating the second given number "n" of binary information input channels to produce a second sequence of binary information pulses in a particular unary code wherein 2^n possible states are represented by a number of sequential pulses that are representative of the binary information in the "n" binary information input channels:

means for multiplexing said second sequence of binary information pulses in each frame of the pulse train sequentially to said first sequence of analog information pulses; and

means for producing a sync signal that persists for the interval between the second sequence of binary information pulses and the subsequent first sequence of analog information pulses in the next frame.

4,346,381

BROAD BAND COUPLING ARRANGEMENT

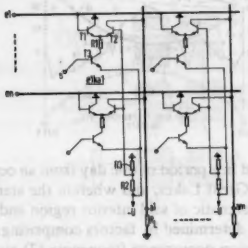
Helmut Bauch, Starnberg, and Hans Rehm, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,659

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932587

Int. Cl.³ H04Q *9/00*; H03K *19/20*

U.S. Cl. 340—825.93 6 Claims



1. A broad band coupling arrangement comprising a matrix of cross point circuits in ECL technology, said coupling point circuits being formed of cross point switches (e1ka) constructed only with transistors (T1, T2, T3) which are conductive only in the through-connected condition of the respective cross point switch, said matrix having an input line (e) and an output line (a), the cross point switches being respectively formed by a differential amplifier circuit with two emitter-coupled transistors (T1, T2) having a common emitter current branch, having base electrodes and having collector electrodes, and a switching transistor (T3) having main electrodes coupled with the common emitter current branch which switching transistor is conductive only upon selection of the appertaining cross point switch, one of the emitter-coupled transistors (T1) of each cross point switch having its base electrode connected to the input line (e) of the matrix, and the output line (a) of the matrix being connected to the collector electrode of one of the emitter-coupled transistors (T2), said matrix having rows and columns of the differential amplifier circuits, the base electrodes of one of the emitter-coupled transistors (T1) of a row of differential amplifier circuits being connected in common with the input line (e), and being multiply connected with one another, the collectors of one of the emitter coupled transistors (T2) of a column of differential amplifier circuits being connected in common with the output line (a), characterized in that the collectors of the ones of the emitter coupled transistors (T2) which are connected in common to the output line (a) of the matrix are respectively multiply connected with one another via a signal path free of inverse feedback.

4,346,382

DOPPLER RADAR FOR DETECTION AND LOCALIZATION OF HELICOPTERS

Henri J. Bosc, Paris, and Pierre J. Goyard, Fontenay-le-Fleury, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 10, 1980, Ser. No. 168,183

Claims priority, application France, Aug. 23, 1979, 79 21210

Int. Cl.³ G01S *13/52, 13/28, 13/44*

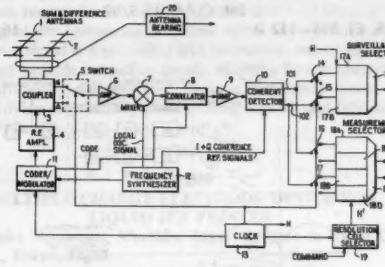
U.S. Cl. 343—5 SA 13 Claims

1. A radar system for discrete identification and localization of helicopters comprising:

a radar transmitter and antenna system for illuminating a target with electromagnetic energy;

a receiver responsive to echo signals from said target resulting from said illumination; and

evaluation means responsive to output signals of said receiver for rejecting echo signals not characteristic of helicopter echoes, said evaluation means including circuits for applying the criteria of percentage amplitude modulation, the criterion of spectral width or both of said criteria, said evaluation means acting to reject echo signals



having spectral width below a predetermined value, echo signals having a percentage of amplitude modulation below a predetermined value or to reject said echo signals failing to exceed either of said predetermined values.

4,346,383

CHECKING THE LOCATION OF MOVING PARTS IN A MACHINE

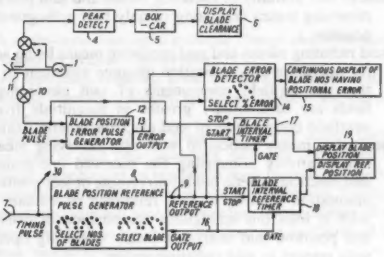
Sydney C. Woolcock, Wells, and Edwin G. Brown, Bath, both of England, assignors to EMI Limited, Hayes, England

Filed Aug. 1, 1980, Ser. No. 174,581

Claims priority, application United Kingdom, Aug. 4, 1979, 7927250

Int. Cl.³ G01S *13/08*; G01R *27/04*

U.S. Cl. 343—12 R 11 Claims



1. In a turbine engine comprising a set of turbine blades extending radially of an axis of rotation and a casing surrounding the set, the improvement of means for monitoring the clearance between the blades and the casing comprising:

means for producing electromagnetic waves of millimetric wavelength λ having a reference phase,

a waveguide fixed relative to the casing and having an aperture facing the said set of turbine blades, and spaced therefrom by λ/4 or less, the area of the aperture being small in relation to the radially facing cross-sectional area of any one of the said blades, the waveguide and aperture being dimensioned to allow the said waves to propagate from the producing means through the aperture,

a phase detector coupled to the producing means and the waveguide to produce a signal, dependent on the phase difference between the said reference phase and the phase of the reflected waves,

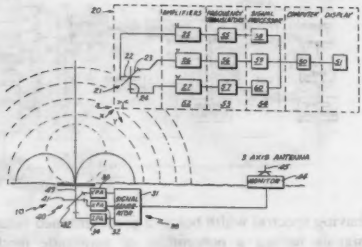
and further means for producing a further signal representing the amplitude of the reflected waves, thereby to indicate the presence of a blade in proximity to the waveguide.

4,346,384

REMOTE OBJECT POSITION AND ORIENTATION LOCATOR

Frederick H. Raab, Burlington, Vt., assignor to The Austin Company, Cleveland, Ohio

Filed Jun. 30, 1980, Ser. No. 164,783
Int. Cl.³ G01S 3/02
U.S. Cl. 343—112 R **16 Claims**



1. Apparatus for determining the position and orientation of a remote object relative to a reference coordinate frame comprising:

a plurality of radiating means having orthogonal components centered about the origin of said reference coordinate frame;

transmitter means for applying to said plurality of radiating means electrical signals which generate a plurality of electromagnetic fields, said plurality of electromagnetic fields being distinguishable from one another;

a plurality of receiving means disposed on said remote object, said receiving means having orthogonal components for detecting and measuring the received components of said electromagnetic fields;

one of said plurality of radiating means and said plurality of receiving means consisting of only two orthogonal components;

said radiating means and said receiving means being adapted for operation at a separation distance sufficient to insure that the far-field components of said electromagnetic fields are substantially greater in magnitude from the nearfield components of said electromagnetic fields; and

analyzing means associated with said receiving means for non-iteratively converting the received components of said electromagnetic fields into remote object position and orientation relative to said reference coordinate frame with at least one ambiguous combination of orientation and position, said analyzing means operating open loop with respect to said radiating means.

4,346,385

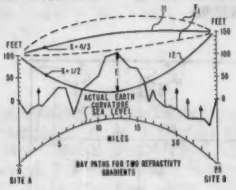
MICROWAVE ANTENNA HEIGHT PREDICTION

James A. Schiavone, Bridgewater, and Arvids Vigants, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 18, 1980, Ser. No. 188,320
Int. Cl.³ H01Q 19/00, 9/34
U.S. Cl. 343—703 **6 Claims**

1. A microwave transmission facility comprising at least two antennas at opposite ends of a transmission path, wherein the heights of said antennas above ground are chosen by a path profile procedure wherein an effective earth radius is utilized having a ratio to the actual earth radius of K, wherein K is determined from N′, the vertical gradient of refractivity of the atmosphere in the vicinity of said path, characterized in that said transmission facility is designed to provide a probability of outage due to obstruction fading of less than a given amount, wherein

the value of N′ is chosen to produce said probability of outage according to the weighted sum of probability density functions comprising a first density function characteristic of the mixed atmosphere of the daytime regime, and a second density function characteristic of the stratified atmosphere of the nighttime regime, wherein the standard deviation of said second function is the larger of those characteristic of a coastal region and an interior region, with the extent of the coastal region being determined by factors comprising the distance that air penetrates inland in a period of one day from an ocean, gulf, or one of the Great Lakes, and wherein the standard deviations characteristic of said interior region and said coastal regions are determined by factors comprising: (1) temperature inversion occurrence frequency; (2) air homogeneity; (3) water body proximity; (4) wind direction occurrence frequency; (5) air moisture capacity; and (6) surface moisture availability.

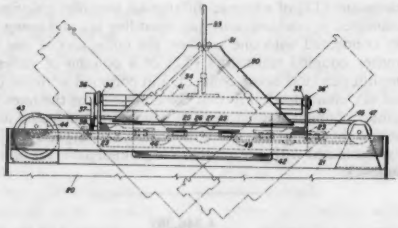


4,346,386

ROTATING AND TRANSLATING RADAR ANTENNA DRIVE SYSTEM

William H. Francis, Coconut Creek, and Eckard F. Natter, Coral Springs, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 19, 1981, Ser. No. 275,189
Int. Cl.³ H01Q 13/10
U.S. Cl. 343—765 **12 Claims**



1. A rotating and translating mount for a radar antenna comprising,

a base;

a carriage adapted to move translationally along said base;

a radar atenna;

means for securing said antenna to said carriage for rotary motion of said antenna about an axis orthogonal to the direction of translational motion of said carriage; and

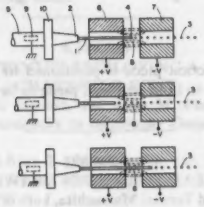
a double slider mechanism for converting translational motion of said carriage to rotary motion of said antenna, said mechanism including a rod rigidly attached to said antenna and extending in the direction of the beam produced by said antenna; and

means attached to said base and slidingly engaging said rod to constrain said rod to pass through a point fixed relative to said base during motion of said carriage.

4,346,387
METHOD AND APPARATUS FOR CONTROLLING THE ELECTRIC CHARGE ON DROPLETS AND INK-JET RECORDER INCORPORATING THE SAME

Carl H. Hertz, Skolbänksvägen 8, S-223 67 Lund, Sweden

Filed Dec. 2, 1980, Ser. No. 212,115
Claims priority, application Sweden, Dec. 7, 1979, 7910088; Feb. 5, 1980, 8000880
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 57 Claims



1. A method of providing a stream of liquid droplets which carry thereon electric charges of predetermined magnitude and polarity, comprising the steps of

(a) providing an electrically conductive liquid jet which breaks up at a drop formation point to form liquid droplets;

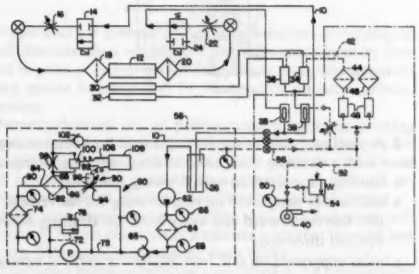
(b) providing an electric field, through which said droplets are directed, having an electric potential gradient; and

(c) controlling the location of said drop formation point within said electric field along said gradient thereby to control the electric charge on said droplets.

4,346,388
INK JET FLUID SUPPLY SYSTEM

Robert A. Wiley, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 13, 1980, Ser. No. 159,016
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 12 Claims



1. A system for supplying fluid to the fluid supply line of an ink jet system, comprising

a fluid reservoir,

pump means having a pump inlet, connected to receive fluid from said fluid reservoir, and a pump outlet,

a filter means, including a mainstream influent inlet, a mainstream effluent outlet, and a filtrate effluent outlet, for filtering a portion of the fluid passing between said mainstream influent inlet and said mainstream effluent outlet and providing the fluid so filtered to said filtrate effluent outlet, said mainstream influent inlet being connected to said pump outlet,

variable restriction means, connecting said mainstream fluid outlet to said pump inlet, for controllably restricting flow therebetween in response to a restriction control signal,

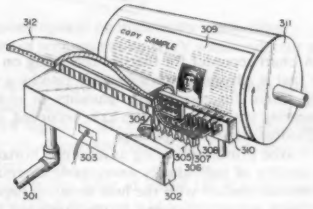
flow measuring means for connecting said filtrate effluent outlet of said filter means to said fluid supply line of said ink jet printer and for providing a flow signal in response to fluid flow therethrough, and

means, responsive to said flow signal and to a reference level signal, for comparing said flow signal and said reference level signal and providing said restriction control signal to said variable restriction means, whereby flow is restricted sufficiently through said variable restriction means to provide substantially uniform fluid flow to said fluid supply line.

4,346,389
MULTIPLE CHARGE ELECTRODE DEVICE FOR LIQUID JET PRINTER

Haruhiko Nagayama, Machida, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 192,090
Claims priority, application Japan, Oct. 11, 1979, 54/129918; Oct. 11, 1979, 54/129919; Nov. 9, 1979, 54/145096
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 2 Claims



1. A multi-layer laminated multiple charge electrode device for a liquid jet printer, comprising:

a first insulating substrate plate having a plurality of downwardly opening U-shaped apertures adjacent a lower edge thereof;

a conductive first shield plate having one major surface secured to said first insulating substrate plate, said first shield plate having an insulating layer thereon and a corresponding plurality of downwardly opening U-shaped apertures adjacent said lower edge, the apertures of said first shield plate being smaller than the apertures of said first insulating substrate;

a conductive charge electrode layer on the surface of said first insulating substrate plate remote from said first shield plate, said charge electrode layer extending over the inner surfaces of said apertures of said first insulating substrate plate;

a second insulating substrate plate having one major surface secured to the other major surface of said first shield plate, said second insulating substrate plate having a corresponding plurality of downwardly opening U-shaped apertures adjacent said lower edge, the apertures of said first shield plate being smaller than the apertures of said second insulating substrate plate;

a conductive second shield plate having one major surface secured to the other major surface of said second insulating substrate plate, said second shield plate having an insulating layer thereon and a corresponding plurality of downwardly opening U-shaped apertures adjacent said lower edge, the apertures of said second shield plate being smaller than the apertures of said second insulating substrate plate; and

a conductive charge sensor layer on a major surface of said second insulating plate, said charge sensor layer extending

over the inner surfaces of said apertures of said second insulating substrate plate,

whereby the aligned U-shaped apertures of said plates comprise a corresponding plurality of channels for charging, and sensing the charge upon streams of liquid droplets traversing said channels.

4,346,390

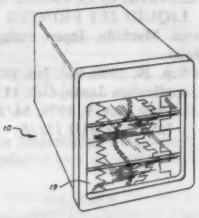
SOLID STATE RECORDER

Charles A. Allen, Richardson, and David T. Houston, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1980, Ser. No. 156,455

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **20 Claims**



1. A chart recorder for thermal recording on heat sensitive paper that is advanced at a selectable rate by a motive means having means for receiving a plurality of electrical signals representing various parameters to be recorded, and annotated, as individual traces, comprising:

(a) a fixed printhead having at least one horizontal line of a plurality of individually energizable thermal elements in thermal contact with the heat sensitive paper;

(b) drive means connected to the printhead for energizing selected thermal elements and for activating the motive means; and

(c) digitizing means for receiving and simultaneously digitizing the plurality of electrical signals; and

(d) digital computer means including central processor means, timing means, read-only memory means having instructions means therein for controlling the operation of the computer means, and read and write memory means for storing digital data including the plurality of digitized signals to be recorded, the computer means adapted to receive the plurality of digitized signals and connected to the drive means for causing the drive means to energize selected thermal elements in conformance with the digitized signals and for causing the activation of the motive means to advance the heat sensitive paper.

4,346,391

RECORDER

Yuji Sato, and Shoji Koizumi, both of Kobe, Japan, assignors to Furuno Electric Co., Ltd., Hyogo, Japan

Filed Oct. 6, 1980, Ser. No. 193,973

Claims priority, application Japan, Oct. 11, 1979, 54-141113[U]

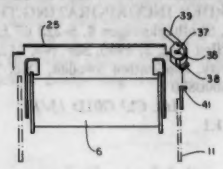
Int. Cl.³ G01D *15/34;* **B65H** *17/02, 27/00*

U.S. Cl. 346—136 **9 Claims**

1. In a recorder having recording paper mounted to advance lengthwise from a body with curved surface to a roller, and having at least one recording stylus mounted to move transversely across the width of the recording paper, with a lead piece placed in the path of the recording stylus extending over the edge of the recording paper for smoothly leading the recording stylus into the recording paper; the improvement wherein:

(i) said lead piece is rotatably supported on said recorder,

(ii) means are provided for continuously biasing the lead piece in a direction to withdraw the lead piece from the path of the recording paper, and



(iii) an obstruction piece is positioned to push said biasing means so as to hold said lead piece to lie over said recording paper.

4,346,392

PLOTTING HEAD FOR USE IN DRAWING MACHINE

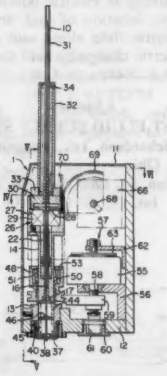
Taketo Isobe, and Terumi Matsushita, both of Chigasaki, Japan, assignors to Mutoh Industry Ltd., Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,328

Claims priority, application Japan, Apr. 12, 1979, 54-44551; Oct. 26, 1979, 54-139016; Oct. 26, 1979, 54-139017; Feb. 6, 1980, 55-13233; Feb. 6, 1980, 55-13234; Feb. 6, 1980, 55-13235; Feb. 6, 1980, 55-13687[U]; Feb. 6, 1980, 55-13688[U]

Int. Cl.³ G01D *15/24*

U.S. Cl. 346—139 C **20 Claims**



1. A plotting head for supporting a lead for selective engagement with a drafting sheet in a drawing machine, comprising:

a housing supported on said drawing machine;

a lead holder supported on said housing for movement relative thereto toward and away from the drafting sheet in a vertical direction;

a collet supported on said lead holder for vertical movement relative thereto between a first upper position and a second lower position, said collet having a central vertical opening for receiving the lead;

first means for effecting movement of said collet between said first and said second positions;

second means for actuating said collet as said collet moves to said first position, said collet being in gripping engagement with the lead in said first position and being free of gripping engagement with the lead in said second position;

bias means for continuously and yieldably urging said lead holder downwardly;

selectively actuable third means cooperable with said lead holder for effecting upward movement of said lead holder against the urging of said bias means, said third means

including an actuator supported for reciprocal vertical movement and clutch means cooperable with said lead holder and said actuator for transmitting only upward movement of said actuator to said lead holder;

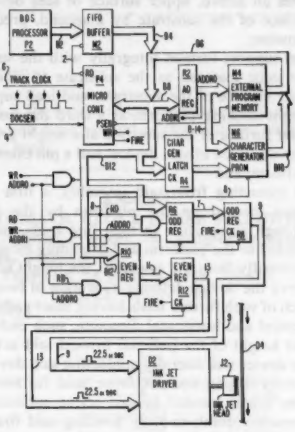
lead gripping means supported on said housing adjacent the lower end thereof for frictionally engaging said lead to yieldably resist vertical movement of said lead;

whereby when said collet is in said first position and said third means is deactuated, said collet grips the lead and said bias means urges said lead holder and said collet downwardly, thereby urging the lead into engagement with the drafting sheet.

4,346,393
MATRIX PRINTER EMPLOYING A SPECIAL CHARACTER FONT

Harry L. Wallace, Livonia, and John M. Chambors, Canton, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 2, 1980, Ser. No. 145,779
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **1 Claim**



1. Apparatus for generating printed characters according to a novel character font where the characters are formed by dots printed in print positions on the face of a moving document by printing means forming part of the head of a matrix printer, comprising:

a drop-on-demand ink jet printer head supporting printing means including a plurality of distinct ink jet elements for projecting drops of ink to print dots on selected surfaces;

said printing means comprising a plurality of said ink jet elements spaced apart in an odd and an even column;

said ink jet printer head supporting said odd and even columns of ink jet elements in a manner such that the odd and even columns are parallel to each other;

said columns being oriented in a direction to be substantially perpendicular to horizontal rows, along which ink dots are placed;

the ink jets in the columns being offset from each other vertically so that each jet produces dots along a separate horizontal line;

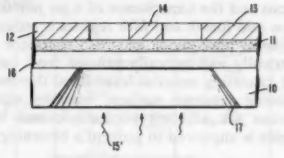
register means coupled to said printer head to provide command pluses to drive said ink jet elements, causing each driven ink jet element to project a drop of ink and provide a dot on the selected surface;

said register means applying said command pulses to energize said ink jet elements in a sequence to assure that dots in successive adjacent print positions are placed on the surface by different ones of said ink jet elements and to assure that each ink jet element can be fired only on the occurrence of an alternate command pulse, whereby successive dots generated by any two ink jet elements will appear on different horizontal lines and successive dots generated by any one ink jet element will appear along a horizontal line with a blank space between dots.

4,346,394
GALLIUM ARSENIDE BURRUS FET STRUCTURE FOR OPTICAL DETECTION

Luis Figueroa, Woodland Hills, and Huan-Wun Yen, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 24, 1980, Ser. No. 133,183
Int. Cl.³ H01L *27/14, 29/80, 31/10*
U.S. Cl. 357—30 **8 Claims**



1. An integrated optical photodetector comprising:

(a) a substrate of semi-insulating III–V semiconductor material and

(b) at least one detector supported on said substrate, said detector including:

(i) an active region of III–V semiconductor material, and

(ii) a pair of electrodes contacting said active region, characterized by

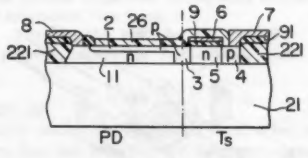
(c) an undoped buffer layer of mixed III–V semiconductor material provided between said substrate and said active region, said buffer layer having an indirect bandgap, said bandgap being larger than that of said active region; and

(d) at least one opening in said substrate which exposes a portion of said buffer layer, said at least one opening operably associated with said at least one detector for introducing incident optical radiation thereon.

4,346,395
LIGHT DETECTING PHOTODIODE-MIS TRANSISTOR DEVICE

Hirobumi Ouchi, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,282
Claims priority, application Japan, Mar. 28, 1979, 54-35555
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **9 Claims**



1. A light detector device comprising a plurality of photodiode and MIS transistor couples arranged adjacent to each other on one surface of an insulating substrate,

each photodiode and MIS transistor couple having a photodiode which includes a first semiconductor region of one conductivity type on and adjoining the insulating substrate surface, a second semiconductor region of an oppo-

site conductivity type in said first region, said second and first regions forming therebetween a photosensitive pn junction substantially parallel to the insulating substrate surface, and an electrode in ohmic contact with said first region, and a MIS transistor which includes third and fourth semiconductor regions of said opposite conductivity type as source and drain regions on the insulating substrate surface, said third region being contiguous with said second region of said photodiode, a fifth semiconductor region of said one conductivity type between said third and fourth regions as a channel region on the insulating substrate surface, an insulating film on said fifth region, a gate electrode formed on said insulating film, and an electrode for light signal read out formed in ohmic contact with said fourth region, said third, fourth and fifth regions extending to and reaching the insulating substrate surface whereby a stray capacitance due to the capacitance of a pn junction formed between said third and fifth regions and the capacitance of a pn junction formed between said fourth and fifth regions is reduced, and

the adjacent photodiode and MIS transistor couples being electrically and optically isolated from each other by a solid insulating material layer filled therebetween on the insulating substrate surface, whereby signal separation between the adjacent photodiode and MIS transistor couples is improved to prevent a blooming phenomenon.

4,346,396

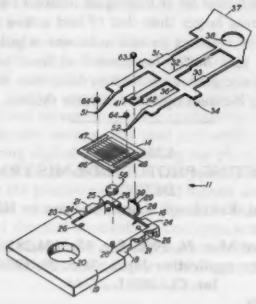
ELECTRONIC DEVICE ASSEMBLY AND METHODS OF MAKING SAME

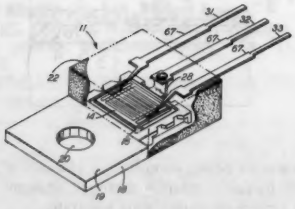
Arthur E. Carroll, II, Raytown, Mo.; Basil C. Lewis, Jr., Reading, Pa., and Howard T. Yeazel, Leawood, Kans., assignors to Western Electric Co., Inc. and Bell Telephone Laboratories, Inc., both of New York, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,543

Int. Cl.³ H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—70 **3 Claims**





1. An electronic device assembly which comprises:

a substrate of a heat and electricity conducting material having a first thickness, the substrate having a recessed seat bounded by retaining ledges, said seat having a depth of a first predetermined dimension between an inner surface of the substrate and a substantially flat bottom surface of the seat, the seat further having a rectangular shape in a plane parallel to the inner surface of the substrate and four pedestals of the same material as that of the substrate extending from the bottom surface, said pedestals spaced apart from each other toward the four corners of the seat and having a height above said bottom surface of the seat which is less than said depth of said seat from said inner surface of the substrate;

an electronic device mounted in said seat and having a mounting surface spaced from said bottom surface by the height of said pedestals, a space between said bottom surface of said seat and said mounting surface being substantially occupied by reflowed solder, which bonds said device to said substrate, the lateral extent of said device being less than that of the rectangular shape of the seat, such that a moat-like opening is formed about the periphery of the device, said moat-like opening being bounded outwardly by the ledges of said seat, said solder also occupying at least part of said opening and being retained by said ledges, said device having a thickness which locates an active, upper surface of said device above the surface of the substrate by a second, predetermined dimension;

a lead support formed integrally with the substrate and of the same material as the substrate to extend above the inner surface of the substrate, said lead support having a height-defining platform at a third dimension above the inner surface of the substrate at a height greater than said active surface of said device, and a pin extending from the platform; and

leads extending from said assembly, a first of such leads being located on the platform by the pin extending through an aperture in such first leads and being solder bonded to the platform and extending from said platform outwardly from the assembly, the height of said first lead above the device defining a location of two further leads, each of such further leads having inner ends tapered in the vertical and horizontal direction, such ends sloping from said height of the pedestal toward said active surface of the device and laterally contacting said device in a downwardly urging contact force, said further leads having been solder bonded to said active surface in a bonding operation simultaneously bonding said first lead to said platform and reflowing said solder between said substrate and said device while said device was being held between opposite urging forces between the pedestals and the ends of said second leads.

4,346,397

APPARATUS FOR REPRODUCING A VIDEO SIGNAL OF ONE SYSTEM WITH CONVERSION TO A VIDEO SIGNAL OF ANOTHER SYSTEM

Yoshihiko Ota, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 23, 1979, Ser. No. 5,688

Claims priority, application Japan, Jan. 23, 1978, 53-5225; Jan. 23, 1978, 53-5226; Jan. 23, 1978, 53-5227; Jan. 23, 1978, 53-5228

Int. Cl.³ H04N *5/78*

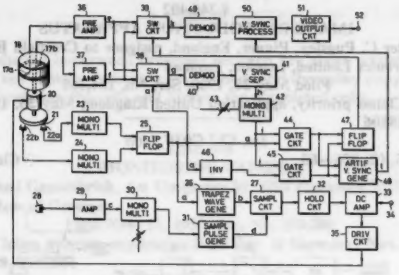
U.S. Cl. 358—4 **12 Claims**

1. An apparatus for reproducing a video signal of a certain system having a field frequency F1 and a number N1 of horizontal scanning lines within one field period which has been recorded on a magnetic tape travelling at a speed S1 along a plurality of mutually parallel tracks formed obliquely relative to the longitudinal direction of the tape, with conversion of the video signal to a video signal of another system having a field frequency F2 and a number N2 of horizontal scanning lines, said reproducing apparatus comprising:

means for causing said tape to travel at a speed S2 which is represented by the equation

$S2 = F2/F1\ S1$; and

reproducing means for causing rotary heads to trace each track on said travelling magnetic tape thereby utilizing a signal over a tracing range of a length l2 substantially as a reproduced signal corresponding to a unit field amount, said length l2 being represented by the equation



$$l2 = (N2/N1)l1,$$

wherein l1 is the length of the recording track corresponding to a unit field amount of the recorded signal on the magnetic tape.

4,346,398

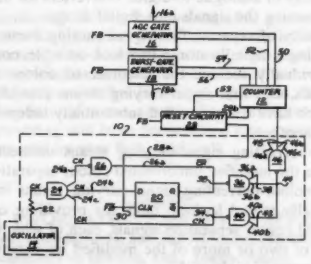
AUTOMATIC CLOCK PHASE SELECTOR

Stephen Lai, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 27, 1980, Ser. No. 200,673

Int. Cl.³ H04N 9/46

U.S. Cl. 358—20 **6 Claims**



1. In a television receiver which develops a flyback pulse and which has an AGC gate generator, a burst-gate generator, and a counter for enabling the AGC gate generator and the burst-gate generator for given time intervals during each horizontal video line in response to input pulses applied to the counter, an automatic clock phase selector for applying input pulses of selected phases to the counter to enable the generators during selected time intervals comprising:

means for generating a train of true clock pulses having positive portions and negative portions, and for generating a train of complementary clock pulses having positive portions and negative portions; and

selector means receiving said clock pulses and the flyback pulse and being responsive to time coincidence between a selected edge of the flyback pulse and the positive portion of a true clock pulse for coupling a selected one of the trains of clock pulses to the counter, and being responsive to time coincidence between said edge of the flyback pulse and the negative portion of the true clock pulse for coupling the other train of clock pulses to the counter so that the intervals during which the AGC gate generator and the burst-gate generator are enabled track with the occurrence of said edge of the flyback pulse.

4,346,399

COLOR TEMPERATURE CONTROL CIRCUIT

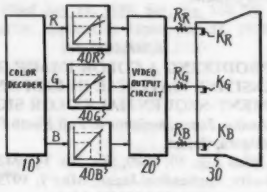
Touru Akutagawa, Irima; Takashi Okada, and Yutaka Tanaka, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1981, Ser. No. 231,438

Claims priority, application Japan, Feb. 8, 1980, 55-15364

Int. Cl.³ H04N 9/535

U.S. Cl. 358—29 **4 Claims**



1. A color temperature control circuit for a color television receiver, comprising:

(A) a color decoder circuit supplied with a composite video signal and for generating red, green and blue primary color signals at its outputs;

(B) a video output circuit for amplifying said three primary color signals;

(C) a tri-color cathode ray tube having three control electrodes adapted to receive said three primary color signals from said video output circuit; and

(D) a circuit arrangement connected between said color decoder circuit and said video output circuit, said circuit arrangement having the same transfer function for all three primary color signals when the input signals are below a predetermined level and having a transfer function for the blue primary color signal larger than that for the red primary color signal when input signal levels of said blue and red primary color signals are larger than said predetermined level.

4,346,400

MATRIX CIRCUITS

Paulus J. M. Hovens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,235

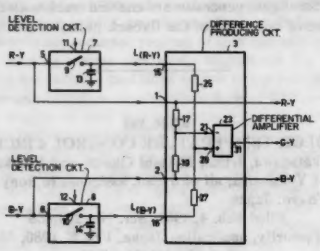
Claims priority, application Netherlands, Nov. 9, 1979, 7908215

Int. Cl.³ H04N 9/52

U.S. Cl. 358—30 **4 Claims**

1. A matrix circuit for obtaining a third color difference signal from first and second color difference signals to be applied to inputs thereof comprising: a difference producing circuit a first and a second level detection circuit for obtaining a first and a second level correcting signal to be applied to said difference producing circuit, said first and the second color difference signals also being applied to said difference producing circuit, and said difference producing circuit further comprising a circuit for compensating a mutual influencing of levels of said color difference signals, and wherein an input of

the first and an input of the second level detection circuits are connected to the relevant inputs of the matrix circuit for applying uncompensated color difference signals to the inputs of the level detection circuits.

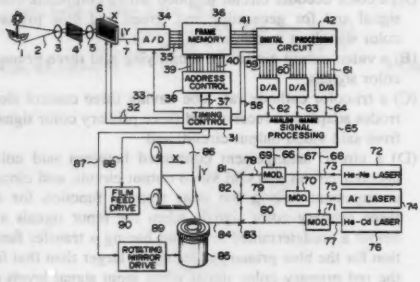


4,346,401

REPRODUCING A COLOR IMAGE ON A PHOTOSENSITIVE MATERIAL IN RESPONSE TO AN ELEMENT-SEQUENTIAL COLOR SIGNAL

Yuji Ohara, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 30, 1980, Ser. No. 145,242
Claims priority, application Japan, May 1, 1979, 54-53630
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **12 Claims**



1. A method of reproducing a color image on a subtractive color photosensitive material by use of an electric signal obtained by two-dimensionally scanning an original color image in which the electric signal carries regularly and alternately contained signal components for different color components in every section of the electric signal corresponding to every picture element of the original color image, said method comprising the steps of:

analog-to-digital converting the electric signal to obtain a digital signal;

dividing said digital signal into a plurality of digital signals, one for each color component, each of said plurality of digital signals having signal sections, having color components of a given level therein, separated by at least one intervening signal section having no color component therein;

processing each of said plurality of digital signals by filling in each said at least one intervening signal section having no color component therein in accordance with at least the level of the color component in an adjacent signal section to derive at least one filled in section for each signal section, each said signal section and said at least one filled in section comprising a filled in divided signal;

digital-to-analog converting the filled in divided signals to derive respective analog signals;

modulating respective laser beams with said respective analog signals to produce respective modulation output signals;

combining said respective modulation output signals into a single output signal; and

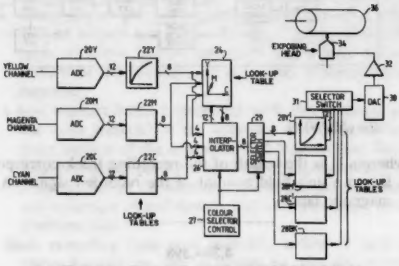
recording a color image on a subtractive color photosensitive material by two-dimensionally scanning in accordance with said single output signal.

4,346,402

IMAGE-REPRODUCTION APPARATUS

Peter C. Pugsley, Pinner, England, assignor to Crosfield Electronics Limited, London, England

Filed May 28, 1980, Ser. No. 154,168
Claims priority, application United Kingdom, May 30, 1979, 7918806
Int. Cl.³ G03F *3/08*
U.S. Cl. 358—80 **9 Claims**



3. Apparatus for the production of colour-separated and colour-corrected images from a coloured original, including an electro-optical scanner for producing uncorrected colour separation signals corresponding to successively scanned elements of the original, comprising:

a plurality of analogue-to-digital converters for individually converting the signals into digital form;

a plurality of separate first signal-varying means, each including a digitally stored first look-up table, connected to individually receive the uncorrected colour separation signals, said first signal-varying means providing signals which have been modified substantially independently of one another;

colour-correcting signal-varying means connected to receive the modified uncorrected colour separation signals, the colour-correcting signal-varying means including a digitally stored look-up table for providing colour-corrected colour separation signals, each of which is a function of two or more of the modified uncorrected colour separation signals; and

means for deriving from the colour-corrected signals, output signals for application to one or more output devices by means of which each colour-corrected colour-separation image is recorded on a recording medium.

4,346,403

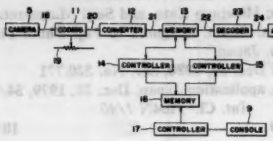
PROCESS AND DEVICE FOR PRODUCING ANIMATED CARTOONS

Shigeru Tamura, Tokyo, Japan, assignor to Kabushiki Kaisha n a c, Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,680
Claims priority, application Japan, Sep. 21, 1979, 54-120708
Int. Cl.³ H04N *5/24*
U.S. Cl. 358—93 **2 Claims**

1. An animated cartoon production process comprising the steps of: photographing a plurality of drawings one by one using a TV camera; causing the photographed drawings to be stored one by one in an image storage device; reproducing and

displaying desired drawings successively by an image display device to check the motion of the figures in the animation;



producing in-between drawings between key shots, adjusting the key shots or removing any of them; and thereafter copying and painting the cells and filming the completed cells.

4,346,404

MONITORING CAMERA

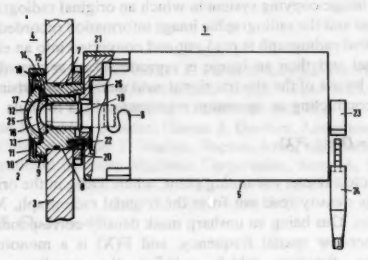
Rudolf Gantenbrink, Am Tiergarten 58, 3000 Hannover 73, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,288

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947864

Int. Cl.³ H04H *7/18*

U.S. Cl. 358—99 **14 Claims**



1. A monitoring camera for a submersible pressure vessel, particularly a bathyscaphe, which includes an interior and a wall surrounding the interior and having an inner side, the camera comprising a rear portion outside said pressure vessel and a front portion installed in an opening of said wall; and at least one lens located at the interior of said pressure vessel and sealingly covering said front portion, said lens projecting only slightly into said interior from said wall.

4,346,405

VISUAL INFORMATION PROCESSING APPARATUS

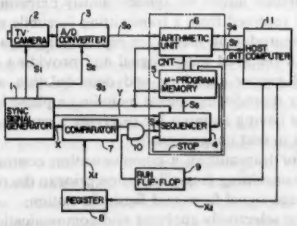
Haruo Yoda, Hinodemachi, and Jun Motoike, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 195,859

Claims priority, application Japan, Oct. 12, 1979, 54-130801

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—105 **6 Claims**



1. A visual information processing apparatus comprising: first means for successively producing digitized two-dimensional image data in a raster-scanning manner; second means for generating a coordinate (X, Y) of a scanning point of said two-dimensional image; third means which is provided with a plurality of microprograms and which executes a microprogram corresponding to a value of said coordinate Y, thereby to process the image data which is produced by said first means; and fourth means for starting said third means when a value of said coordinate X is in agreement with a particular value X_i; wherein said image data is processed for every particular image region.

4,346,406

GRADATION PROCESSING METHOD FOR A RADIATION IMAGE RECORDING SYSTEM

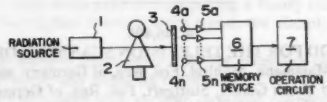
Hisatoyo Kato, and Masamitsu Ishida, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1980, Ser. No. 168,799

Claims priority, application Japan, Jul. 11, 1979, 54-87805

Int. Cl.³ H04N *5/30*

U.S. Cl. 358—110 **7 Claims**



1. In a radiation image recording system including a radiation image information read out system having an amplification gain for scanning a stimulable phosphor plate with a light beam of stimulating rays to cause the stimulable phosphor plate carrying radiation image information to emit light according to the radiation image information stored therein in the form of radiation energy and detecting the emitted light to read out the radiation image information,

a method of gradation processing comprising photoelectrically detecting the light emitted from the stimulable phosphor plate, determining the maximum value Smax, the minimum value Smin and the average value $\overline{S}$ among the image signal obtained by detecting the emitted light, setting the read out level of the radiation image information read out system so that the minimum signal level Smin is made a standard input signal when the difference of log Smax − log Smin is less than a predetermined value and a signal level other than the minimum signal level Smin is made a standard input signal when said difference is not less than said predetermined value and that said standard input signal is read out as a predetermined level of a standard output signal, controlling the amplification gain of the image information read out system to $\Delta s/(\log Smax - \log Smin)$ where Δs is a reproduced signal region in said former case, and fixing the amplification gain at a constant value in said latter case.

4,346,407

APPARATUS FOR SYNCHRONIZATION OF A SOURCE OF COMPUTER CONTROLLED VIDEO TO ANOTHER VIDEO SOURCE

Ralph H. Baer, Manchester, and Leonard D. Cope, Merrimack, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 16, 1980, Ser. No. 159,548

Int. Cl.³ H04N *5/04*

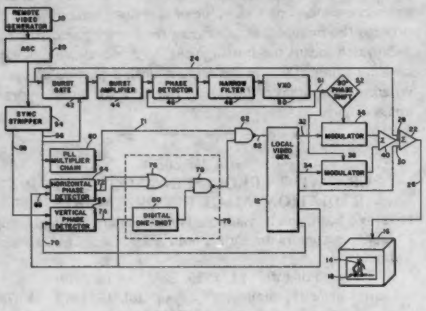
U.S. Cl. 358—149 **23 Claims**

1. Apparatus for synchronizing a source of computer controlled video to a second video source, comprising:

a source of computer controlled video providing video and

synchronization signals in which said synchronization signals are related to its system clock;

a second video source providing video and synchronization signals; and



first means responsive to the synchronization signals of said second video source for generating clock signals for said source of computer controlled video.

4,346,408

METHOD FOR THE TELEVISION SCANNING OF FILMS

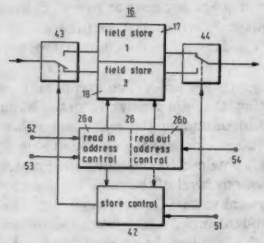
Volker Massmann, Mühltal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,284

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012257; Mar. 29, 1980, 3012327

Int. Cl.³ H04N *3/36*

U.S. Cl. 358—214 **4 Claims**



1. A method for the scanning of films and to derive television signals therefrom with line interlace,

wherein the film is scanned line by line without line interlacing, the signals each belonging to a scanned line are read into a frame store (16) having two field stores (17,18) at an address characterizing the position of the particular line within a film frame,

and the content of the frame store is read-out according to a television standard,

comprising,

for studio asynchronous film speeds below 50 frames per second,

the steps of

reading-in one film frame into one (17) of the two field stores (17,18) of the frame store (16), and simultaneously completely, and repetitively reading-out the other field store (18) until the reading-in of one of the film frames into said one (17) of the field stores (17,18) is completed;

reading-in the next film frame into the other store (18) so that the respective reading-out of one field store (e.g. 17) only begins after the complete reading-in into a field store (then 17) and the complete reading-out, at least once, of the other field store (18).

4,346,409

METHOD OF AND APPARATUS FOR PROCESSING A RADIOGRAPHIC IMAGE

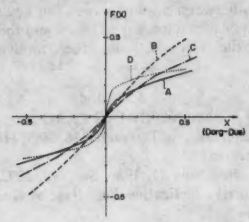
Masamitsu Ishida; Hisatoyo Kato, and Seiji Matsumoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1980, Ser. No. 220,771

Claims priority, application Japan, Dec. 25, 1979, 54/168936

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **10 Claims**



1. A method of processing a radiographic image in a radiographic image copying system in which an original radiograph is scanned and the radiographic image information recorded on the original radiograph is read out and converted into an electric signal and then an image is reproduced on a recording material by use of the electric signal, said method comprising a step of conducting an operation represented by a formula

$$D' = Dorg + F(X)$$

is conducted at every scanning point, where Dorg in the original image density read out from the original radiograph, X is Dorg-Dus, Dus being an unsharp mask density corresponding to a super-low spatial frequency, and F(X) is a monotone increasing function which satisfies the condition of $F'(X_1) \geqq F'(X_2) \geqq 0$ for arbitrary values X_1, X_2 of X ($|X_1| < |X_2|$) and in which there exists at least one certain value X_0 of X which satisfies the condition of $F'(X_1) > F'(X_2)$ when $|X_1| < |X_0| < |X_2|$, whereby the frequency component above said super-low spatial frequency is emphasized.

4,346,410

FACSIMILE RECEIVER

Tetsuo Maeno, Ueda, Japan, assignor to Matsushita Graphic Communications Systems, Inc., Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 138,898

Claims priority, application Japan, Apr. 17, 1979, 54-47630; May 8, 1979, 54-55981

Int. Cl.³ H04N *1/32*

U.S. Cl. 358—281 **2 Claims**

1. A facsimile receiver for demodulating a received image signal through synchronous detection comprising:

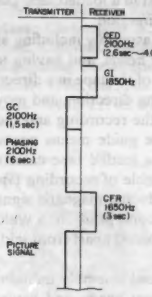
demodulation means for synchronously detecting an image signal received from a transmitting facsimile station;

carrier reproducing means for reproducing a carrier signal from a received image signal and providing said reproduced carrier signal to said demodulation means, said carrier reproducing means including a phase locked loop circuit having an input for receiving a carrier signal contained in said image signal;

means for transmitting a communication control signal to said transmitting facsimile station prior to the reception of an image signal from said facsimile station;

means for selectively applying said communications control signal to the input of said phase locked loop circuit to cause said phase locked loop circuit to operate in response to said communications control signal; and,

a control circuit for providing a control signal which activates said means for selectively applying to cause said



communications control signal to be applied to the input of said phase locked loop.

4,346,411

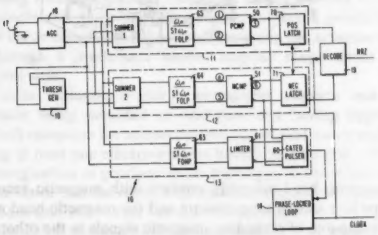
AMPLITUDE SENSITIVE THREE-LEVEL DETECTOR FOR DERIVATIVE READ BACK CHANNEL OF MAGNETIC STORAGE DEVICE

Otto R. Buhler, Boulder; Homer J. Gardner, Longmont, both of Colo., and Peter T. Marino, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1981, Ser. No. 234,519

Int. Cl.³ G11B *5/09, 5/02*

U.S. Cl. 360—46 **7 Claims**



1. A system for reading information stored on a flexible magnetic media comprising:

(a) a magnetic transducer for providing a differential signal representing binary data stored on said flexible media;

(b) first and second peak threshold comparators for respectively detecting positive and negative peaks of said differential signal;

(c) an automatic gain control circuit connected between said transducer and said comparators and including a feedback loop providing a relatively long time constant for said gain control circuit compared to bit times of said binary data;

(d) a voltage threshold generator connected to said AGC circuit for providing a reference threshold voltage to said comparators which is a precise percentage of the voltage peaks of said differential signal and which has a relatively short time constant relative to said bit times; and

(e) clock means responsive to said input signal peaks to sample said peak detectors to establish the amplitude relationship of said input signal to said reference voltage signal.

4,346,412

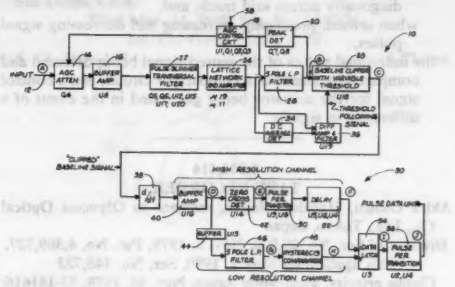
READ SIGNAL PROCESSING CIRCUIT

Bobby E. Conley, Yukon, Okla., assignor to Magnetic Peripherals, Inc., Minneapolis, Minn.

Filed Apr. 21, 1981, Ser. No. 256,158

Int. Cl.³ G11B *5/09, 5/02*

U.S. Cl. 360—46 **7 Claims**



1. A read signal processing circuit for a magnetic storage disk, the circuit receiving an amplified analog read signal from the disk's read-write head and outputting a binary reconstruction of the original encoded write signal, the circuit comprising:

a pulse slimmer transversal filter for receiving the analog read signal and slimming the signal;

a base line clipper with variable threshold connected to the transversal filter for receiving the slimmed signal and inserting an electronic base line in the signal and clipping the slimmed signal between the base line and a threshold level; and

means for converting the clipped base line signal to a pulse transition data signal.

4,346,413

MAGNETIC HEAD POSITIONING SERVO ARRANGEMENT FOR A SYSTEM FOR RECORDING/REPRODUCING INFORMATION ON A MAGNETIC RECORDING MEDIUM, PARTICULARLY ON A FLEXIBLE MAGNETIC RECORDING MEDIUM

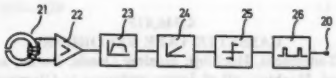
Joachim Hack, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,219

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928311

Int. Cl.³ G11B *5/00, 21/10*

U.S. Cl. 360—77 **12 Claims**



1. A magnetic head positioning servo arrangement for a system for recording/reproducing information on a magnetic recording medium, particularly on a flexible magnetic recording medium, the position of the head being adjustable, relative to the magnetic tracks of the recording medium, by means of an actuator, and at least one reference signal being recorded within or beneath each magnetic track, which signal, when sensed, provides information about the momentary position of the head, this information being compared, in a comparator circuit, with information about the correct position of the head above the track center, and, if there is a difference, a control signal is generated for the actuator which moves the magnetic head back to its correct position,

wherein the reference signal consists of at least one pair of pulse sequences, said pulse sequences

being recorded asymetrically with respect to the center of said track,

consisting of a pulse pattern on said track having a signal free marker zone which is produced by partially erasing the pulse pattern and at least part of which extends diagonally across said track, and,

when sensed, producing increasing and decreasing signal pulses,

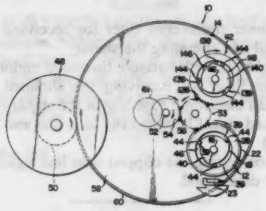
the individual pulses of the sensed signal being detected and compared by means of a comparator circuit, and a control signal for the actuator being generated in the event of a difference in signals.

4,346,414

TAPE RECORDER

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 90,900, Nov. 5, 1979, Pat. No. 4,309,727.
This application May 1, 1980, Ser. No. 145,733
Claims priority, application Japan, Nov. 16, 1978, 53-141616; Nov. 16, 1978, 53-141618; Nov. 16, 1978, 53-157809[U]
Int. Cl.³ G11B *15/32, 15/44, 15/26*
U.S. Cl. 360—90 **3 Claims**



1. A tape recorder embodying a reel mechanism fitted with a pair of one-way clutches and comprising:

a reversible motor;

a center capstan shaft having a flywheel fixed thereto;

a capstan gear fitted to said center capstan shaft;

a pair of spaced reel shafts disposed in a common vertical plane and having reel gears mounted thereon;

an intermediate gear interposed between and engaging said reel gears and said capstan gear with the center of said intermediate gear and the center of said capstan shaft lying in a common vertical plane normal to the vertical plane of said reel shafts; and

a pulley coupled to said motor and engaging said flywheel for transmitting the rotation moment of the motor to one of said reel shafts by one of said pair of one-way clutches.

4,346,415

CASSETTE TAPE RECORDER

Hideo Tomabechi, Hachioji; Hazime Osada, Fuchu, and Akira Osanai, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1980, Ser. No. 156,579
Claims priority, application Japan, Jun. 13, 1979, 54-74488
Int. Cl.³ G11B *15/29, 5/54*
U.S. Cl. 360—105 **4 Claims**

1. A cassette tape recorder for use with a tape cassette loaded therein, said tape cassette containing magnetic recording tape, which comprises:

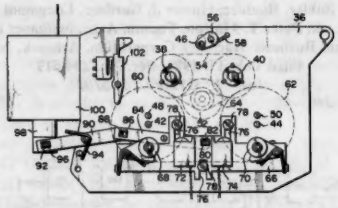
a pair of capstans;

a motor capable of being rotated selectively in one or the other direction at the same constant speed and with the same characteristics;

a power transmission mechanism coupled to said pair of capstans and also to said motor for transmitting the rotation of said motor to at least one of said pair of capstans to cause rotation of at least one of said pair of capstans in either one or the other direction, thereby causing a magnetic recording tape accommodated in a loaded tape cassette to be driven in one or the other direction;

a first magnetic head assembly including at least recording and playback magnetic heads, and having tape guide means for defining a position of the tape in a direction perpendicular to the tape transporting direction, and movable between a first position in which the recording and the playback magnetic heads and the tape guide means contact with a magnetic recording tape in a loaded tape cassette and the magnetic head assembly capable of recording tape driven in said one direction or reproducing magnetic signals from said at least one track and a second position in which the first magnetic head assembly is spaced apart from said magnetic recording tape;

a second magnetic head assembly including at least recording and playback magnet heads, and having tape guide means for defining a position of the tape in a direction perpendicular to the tape transporting direction, and movable between a first position in which the recording and the playback magnetic heads and the tape guide means of said second



magnetic head assembly contact with magnetic recording tape in a loaded tape cassette and the magnetic head assembly capable of recording magnetic signals in the other track or tracks than said at least one track of said magnetic recording tape driven in said other direction or reproducing magnetic signals from said other track or tracks and a second position in which the second magnetic head assembly is spaced from said magnetic recording tape;

a moving mechanism for moving said first and second magnetic head assemblies simultaneously and in the same direction; and

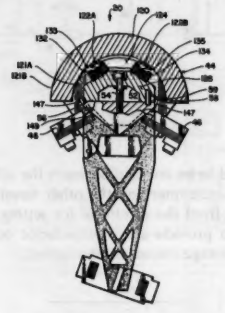
a magnetic head assembly operation switching circuit means for electrically selecting and rendering operative said first magnetic head assembly when said magnetic recording tape is driven in one direction and electrically selecting and rendering operative said second magnetic head assembly when said magnetic recording tape is driven in said other direction;

said second magnetic head assembly being arranged such that it is on the upstream side of the first magnetic head assembly when the magnetic tape is driven in said one direction and it is on the downstream side of the first magnetic head assembly when the magnetic tape is driven in said other direction.

4,346,416
ROTARY ACTUATOR ASSEMBLY FOR DISK DRIVE HEAD POSITIONER

Charles M. Riggle, Acton, Mass.; John D. Read, Monument, Colo.; William B. Noe, Concord; Richard Winfrey, Boxborough, both of Mass.; Christopher A. Pollard, Monument, and Frank W. Bernett, Colorado Springs, both of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 29, 1980, Ser. No. 126,129
Int. Cl.³ G11B 21/02, 5/55
U.S. Cl. 360—106 11 Claims



1. An assembly for moving a read/write recording head over the surface of a magnetic disk recording medium, the recording medium being supported by spindle means for rotating the medium about a spindle axis that is perpendicular to the plane of rotation of the recording medium, the spindle means being supported by a base, the assembly comprising:

an actuator arm having a pivotal end at one extremity and a head supporting end at the other extremity for supporting the head;

an actuator motor comprising a stator and a rotor, the rotor being rotatable about a rotor axis that is parallel to said spindle axis, the rotor being connected to the pivotal end of the actuator arm for pivotally moving the actuator arm through a predefined limited angular range about the rotor axis;

the rotor including a pair of permanent magnets, and the stator being mounted on said base and having opposed shaft receptors for supporting the rotor, said stator including at least one electro-magnet having at least one coil for energization to produce an electromagnetic force between the stator and the rotor, to produce movement of the rotor about said rotor axis; the rotor including

an elongated member having a substantially U-shaped cross-sectional area in the plane normal to the rotor axis;

a pair of aligned stub shaft members located on said rotor axis, one disposed at each end of and connected to the elongated U-shaped member, for use as a shaft for rotation and support of the U-shaped member within the shaft receptors of said stator;

the end surfaces of the open side of the U-shaped member providing mounting surfaces located intermediate said stub shaft members for securing the arm thereagainst;

the actuator arm having a mounting surface at one end thereof adapted to be secured to the U-shaped member of the rotor;

the permanent magnets of the rotor being of elongated configuration, disposed parallel to the rotor axis and being fixed to the outside of the U-shaped member;

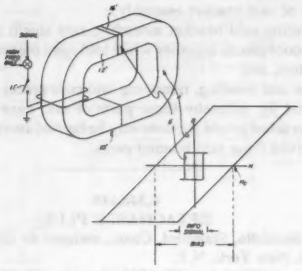
the stator including a stator core that is arcuately shaped thereby to embrace the area of travel of said permanent magnets and a stator coil wound about the stator core;

said permanent magnets being formed to produce a substantially constant magnetic flux density between said permanent magnets and said stator core over the rotational range of the rotor.

4,346,417
SELECTIVELY ACTUABLE MAGNETIC HEAD

Neil J. Griffith, San Diego, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Mar. 24, 1980, Ser. No. 133,076
Int. Cl.³ G11B 5/251, 5/28
U.S. Cl. 360—115 4 Claims



1. Multichannel record head apparatus, comprising:

(a) a plurality of discrete gapped magnetic cores, the gaps of which are disposed along a gap line, said cores respectively being of low coercivity and having magnetic saturation levels greater than that which corresponds to a given amount of applied field;

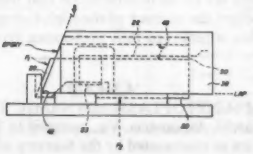
(b) magnetic gapping material extending completely from one side to the other of said gaps, said gapping material being of low coercivity and being magnetically saturable at said given amount of applied field; and

(c) means cooperative with said cores for selectively applying fields thereto of at least said given amount, thereby to saturate magnetically said gaps so that said gaps will support respective recording fringe fields, the field of any given gap being incapable of inductively causing the gap of any other core from exhibiting a fringe field when that other core does not have a selectively applied field applied thereto of said given amount.

4,346,418
HIGH DENSITY MULTITRACK MAGNETIC HEAD

Dennis F. Cullum, Leucadia, and Jelmer Dorreboom, Olivenhain, both of Calif., assignors to Spin Physics, Inc., San Diego, Calif.

Filed Sep. 5, 1980, Ser. No. 184,553
Int. Cl.³ G11B 5/10, 5/42, 5/28; H01F 7/06
U.S. Cl. 360—129 13 Claims



1. The method of assembling part of a multitrack magnetic head having about 30 or more tracks per widthwise inch, said method comprising the steps of

(a) setting a plurality of core pieces in aligned slots of a slotted jig, the core pieces being narrower than a first dimension Y,

(b) setting magnetic shield members between respective pairs of said core pieces, thereby to form an interleaved assembly of shield members and core pieces, said shield members being wider than said dimension Y and being disposed to reside against the shoulders of respective jig slots, whereby the parts of said shield members which do not abut against said shoulders extend away from said interleaved assembly of core pieces and shield members,

(c) embracing said interleaved assembly of core pieces and shield members within a slotted bracket assembly so that the extended parts of said shield members reside in respective slots of said bracket assembly,

(d) bonding said bracket assembly, said shield members, and said core pieces together while said core pieces reside in said jig slots, and

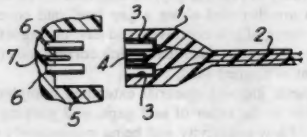
(e) after said bonding, removing said core pieces from the slots of said jig, whereby those parts of said core pieces which had resided in said jig slots may be lapped away or otherwise removed from said bonded parts.

4,346,419

DETACHABLE PLUG

Frank Janniello, Stamford, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,062
Int. Cl.³ H02H *11/00*
U.S. Cl. 361—2 **2 Claims**



1. An electrical connection system for preventing arcing between the contacts comprising:

a socket having two high current male contacts and a low current male contact;

a plug having therein two high current female contacts and a low current female contact for receiving said male contacts;

said socket being part of an electrically powered device requiring high CURRENT:

said high current contacts in said socket being electrically connected to said device and a solid-state switch which is turned off and on by a control gate in electrical connection with said low current contact;

wherein the high current contacts in the socket and the plug are of such dimensions that they join before the low current contacts are joined when the plug is inserted into the socket in said device to be operated and the low current contacts are of such dimensions that their contact is broken before the contact of the high current contacts when the plug is removed thus preventing arcing.

4,346,420

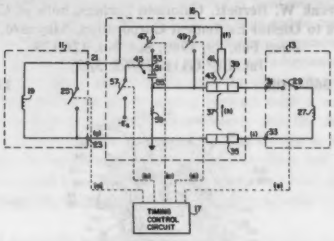
MAGNETOPLASMADYNAMIC SWITCH

Peter J. Turchi, Alexandria, Va., assignor to The United States of America as represented by the Secretry of the Navy, Washington, D.C.

Filed May 28, 1980, Ser. No. 153,987
Int. Cl.³ H02H *3/00*
U.S. Cl. 361—4 **12 Claims**

1. A magnetoplasmadynamic switch for transforming and delivering energy to an inductive load at very high electromagnetic power rates from a storage circuit, the storage circuit including a circuit interrupter in parallel with a storage inductor and carrying a current supplied to the storage inductor from a primary energy source, the switch comprising:

an electrode adapted to be coupled between one terminal of the circuit interrupter and one terminal of the load; and



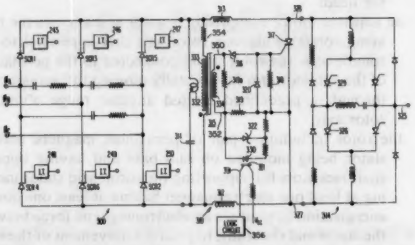
means adapted to be coupled between the other terminal of the circuit-interrupter and the other terminal of the load and spaced from the electrode for jetting plasma to the electrode to provide a low impedance conduction path when the storage circuit is interrupted.

4,346,421

FAULT DETECTOR

George P. Gurr, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Atlanta, Ga.

Filed Jul. 2, 1979, Ser. No. 54,023
Int. Cl.³ H02H *3/08, 7/122*
U.S. Cl. 361—57 **18 Claims**



1. A fault detector for an inverter having a plurality of conduction controlled devices supplied by a source of direct current on a DC bus, which comprises:

a capacitor;

detector means connected to said capacitor in series across said DC bus for sensing current discharged by said capacitor and for supplying an output signal as a function of said current;

means for short circuiting said DC bus in response to said output signal,

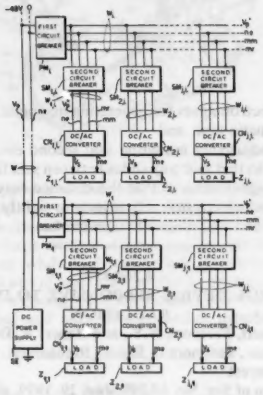
wherein said detector means comprises a saturable core transformer means having a primary winding and a secondary winding, said secondary winding having a first end and a second end, said primary winding connected to said capacitor in series across said DC bus, and said secondary winding supplying said output signal; and

wherein said detector means further comprises Zener diode means connected to said first end of said secondary winding for providing said output signal to said means for short circuiting when said output signal exceeds the Zener voltage of said Zener diode means.

4,346,422
POWER-DISTRIBUTION NETWORK FOR TELECOMMUNICATION SYSTEM

Luciano Inzoli, Lodi, Italy, assignor to Italtel Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Feb. 24, 1981, Ser. No. 237,673
Claims priority, application Italy, Feb. 25, 1980, 20137 A/80
Int. Cl.³ H02H 7/26
U.S. Cl. 361—62 7 Claims



1. A power-distribution network for energizing a multiplicity of loads, comprising:

a supply of direct current connected to a trunk line;

a plurality of primary branch lines connected in parallel to said trunk line via respective first circuit breakers responsive to short circuits in the associated primary branch lines;

a plurality of sets of secondary branch lines each feeding at least one load, the branch lines of each set being connected in parallel to one of said primary branch lines via respective second circuit breakers responsive to short circuits in the associated secondary branch lines;

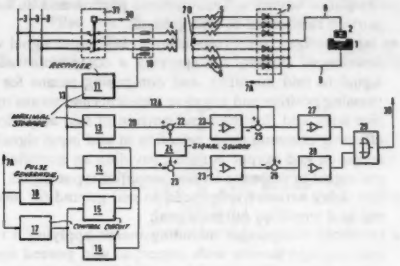
each of said circuit breakers being provided with interrupter contacts in series with a conductor of the associated branch line and with energy-storing means for maintaining at least a predetermined minimum level of energization for any load served thereby over a predetermined recovery period following the occurrence of a short circuit in any parallel branch line to enable substantial restoration of a normal supply voltage in the associated branch line, said energy-storing means including a capacitor connected in each circuit breaker between a high-voltage conductor containing said interrupter contacts and a neutral conductor forming part of the associated branch line; and

chopper-type converters inserted between said secondary branch lines and said loads, each of said second circuit breakers including inductance elements in said high-voltage and neutral conductors thereof forming with the energy-storing capacitor thereof a filter blocking the chopping frequency of any converter connected to the respective secondary branch line.

4,346,423
SHORT CIRCUIT DISCONNECTING CIRCUIT

Hans Matthes, Wermelskirchen, and Klaus Reifenrath, Solingen, both of Fed. Rep. of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid-Hasten, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,962
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032757
Int. Cl.³ B23K 9/10
U.S. Cl. 361—87 6 Claims



1. A circuit for disconnecting the current from the operating gap of an electrolytic processing device in the event of a short circuit comprising:

means for producing a signal indicating the current in said gap;

means connected to said producing means for storing the maximum value of said signal within successive time periods;

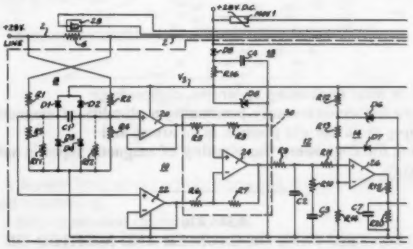
means connected to said storing means for comparing the stored value in the preceding period with said signal indicating gap current and producing a switching signal when the comparison indicates a short circuit has occurred; and

switch means connected to said comparing means for disconnecting the current from said gap when said switching signal is produced.

4,346,424
ELECTRONIC REMOTE CONTROL D.C. POWER CONTROLLER AND CIRCUIT BREAKER

James E. Hansen, Oak Creek, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 22, 1980, Ser. No. 123,593
Int. Cl.³ H02H 3/093, 3/087
U.S. Cl. 361—94 9 Claims



1. In an electrical system having an overload relay in a D.C. power line connecting a D.C. power source to a load device and said relay including D.C. power contacts in said power line and electromagnetic coil means for closing and opening said contacts, electronic means for controlling said relay comprising:

an electronic control circuit supplied from said D.C. source with unidirectional power with respect to ground of said D.C. power source responsive to an external manual control signal for operating said coil means to close said D.C. power contacts and being responsive to an overcurrent trip signal for operating said coil means to trip said D.C. power contacts open;

and an electronic detector circuit responsive to an overcurrent on said D.C. power line for providing said trip signal to said electronic control circuit comprising:

a resistor connected in said D.C. power line for providing an input signal proportional to the current in said line;

an amplifier having a floating input portion and an output portion referenced to said ground;

an input bridge circuit responsive to said input signal when unbalanced thereby for applying a compatible reduced signal to said amplifier, and comprising means for suppressing positive and negative transients and means operative with said floating input portion of said amplifier for effecting common mode rejection in said input signal and means in said output portion providing an amplified output signal in response to said amplifier input signal;

a time delay network referenced to said ground for modifying said amplified output signal;

a threshold comparator including means applying a reference voltage thereto with respect to said ground against which the modified signal from said time delay network is compared to provide an output signal with respect to said ground when said input signal is above a predetermined value indicative of an overload condition in said D.C. power line;

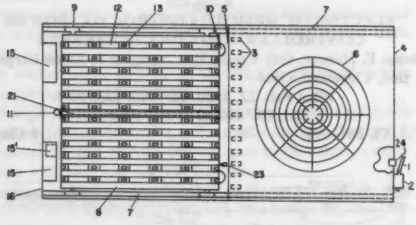
and logic circuit means referenced to said ground responsive to said comparator output signal for providing said trip signal to said electronic control circuit thereby to trip said D.C. power contacts open.

4,346,425

MASS MAGNETIC TAPE DEGAUSSING SYSTEM

Billy C. Gray, 765 Baca Rd., Las Cruces, N. Mex. 88001

Filed Nov. 17, 1980, Ser. No. 207,517
Int. Cl.³ H01F *13/00*
U.S. Cl. 361—151 **9 Claims**



1. A mass degaussing apparatus, comprising,

means for simultaneously positioning a plurality of magnetic tapes in an upright position in an array, and

means for degaussing the plurality of magnetic tapes in said array.

4,346,426

MAGNETIC TAPE DE-GAUSSER AND METHOD OF ERASING MAGNETIC RECORDING TAPE

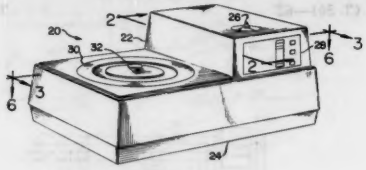
John S. Baumann, Fullerton; Roger W. Knipp, Fountain Valley, and Joseph J. Kacin, Huntington Beach, all of Calif., assignors to Fluxcom, Inc., Anaheim, Calif.

Filed Jan. 7, 1981, Ser. No. 223,142
Int. Cl.³ H01F *13/00*
U.S. Cl. 361—151 **23 Claims**

1. A magnetic tape de-gausser for erasing information encoded on a magnetic tape encased in a magnetic tape container, said de-gausser comprising:

a base having a first electromagnet mounted therein for generating magnetic flux for erasing said magnetic tape;

a tray slidably mounted on said base for conveying said magnetic tape container towards and away from said lower electromagnet;



a second electromagnet for generating magnetic flux for erasng said magnetic tape; and

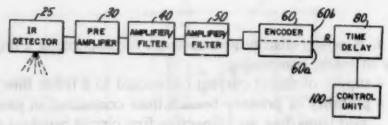
means for adjustably mounting said second electromagnet on said base so that said tray slides between said first and second electromagnets and so that the distance between said first and second electromagnets adjusts to tightly accommodate said tray and said magnetic tape container.

4,346,427

CONTROL DEVICE RESPONSIVE TO INFRARED RADIATION

Kitson Blissett, Freeport, N.Y., and Robert A. Dunbar, Swampscott, Mass., assignors to Robert Rothenhaus, Bayside, N.Y., a part interest

Continuation of Ser. No. 53,249, Jun. 29, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,592
Int. Cl.³ C08B *13/18*
U.S. Cl. 361—173 **58 Claims**



1. A device responsive to heat emanating from a human body for controlling an auxiliary current line, comprising

detection means including an infrared detector for producing detection signals in response to infrared radiation in the frequency spectrum emitted by the human body;

circuit means adapted to receive said detection signals for amplifying them and producing reset signals for those detection signals resulting from movement of a body emanating infrared radiation in said spectrum;

timing means adapted to receive said reset signals for producing a control signal after failing to receive a reset signal for a time period preselected to be longer than the time period expected between movements of a human body within the field of view of said detector; and

control means adapted to receive said control signal for controlling said current line in response thereto.

4,346,428

COUPLING ASSEMBLY WITH BONDING JUMPER

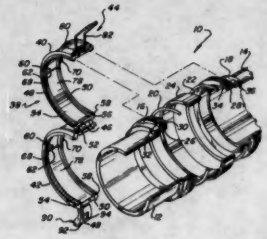
Edwin J. Gale, Aurora, Colo., assignor to Stanley Aviation Corp., Denver, Colo.

Filed Jun. 5, 1980, Ser. No. 156,665
Int. Cl.³ H01R *3/04*
U.S. Cl. 361—215 **6 Claims**

1. A coupling assembly for interconnecting first and second fluid carrying conduit members, comprising:

coupler means removably circumferentially engaging the conduit members to minimize displacement of the conduit members away from each other; and

at least one electrical conductive resilient jumper attached to said coupler means having an elongate body portion with a longitudinal axis, a first arm and a second arm each connected substantially at right angles to opposite ends of said elongated body portion, said first arm extending in a



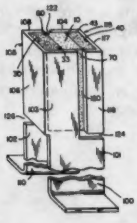
direction opposite said second arm so that, upon engagement of said first arm with the first conduit member, a torque is produced around said axis of said body portion tending to force said second arm against the second conduit member while said second arm produces a torque around said axis of said body portion in the opposite direction so that a strong electrical contact between said electrical jumper and each of the conduit members is provided.

4,346,429

MULTILAYER CERAMIC CAPACITOR WITH FOIL TERMINAL

Henrique V. DeMatos, Greenville, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 9, 1980, Ser. No. 167,191
Int. Cl.³ H01G 1/14
U.S. Cl. 361—310 **1 Claim**



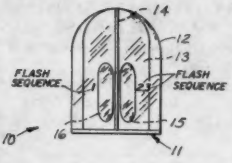
1. A ceramic capacitor device comprising a ceramic chip containing embedded electrodes having a pair of opposed rectangular shaped end surfaces at which surfaces ends of alternate embedded electrodes are exposed and a pair of opposed rectangular shaped side surfaces parallel to said embedded electrodes and substantially larger in area than said opposed end surfaces, each opposed end surface being metallized to provide an electrical contact with exposed ends of embedded electrodes, and portions of each opposed side surface which are contiguous to an end surface being metallized to provide a pair of spaced apart metallized portions on each opposed side surface separated by unmetallized ceramic, a pair of metal foil terminal leads each having a strip portion of substantially the same width as the distance between the opposed end surfaces of the cermanic chip said strip portions being opposite and parallel to each other and parallel to the side surfaces of said ceramic chip, each said strip portion having (i) a first extension overlying one metallized portion of the side surface closest to said strip portion and also overlying most of the unmetallized ceramic of the same side surface and (ii) a second extension of substantially L-shaped cross section overlying the metallized end surface adjacent the aforesaid metallized side surface portion and the metallized portion of the other side surface contiguous to said metallized end surface, the said metallized portions being metallurgically bonded to said overlying metal foil extensions.

4,346,430

CODED STROBE LIGHT DEVICE FOR AIRCRAFT

Bruce B. Holland, 7628 La Sobrina Dr., Dallas, Tex. 75248

Filed Feb. 28, 1980, Ser. No. 125,351
Int. Cl.³ B64D 47/02
U.S. Cl. 362—62 **15 Claims**



1. A light device for use on aircraft comprising:

a first strobe element for flashing a signal in a first regulated sequence;

a second strobe element for flashing a signal in a second regulated sequence;

separator means for permitting emission of the signals of said first and second strobe elements over first and second predetermined arc about the aircraft, the first and second predetermined arcs overlapping in at least one arcuate region; and

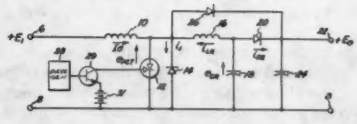
the combined signal of said first and second strobe elements in said at least one arcuate region being distinct from signals in either the first or second regulated sequences to indicate the direction of motion of the aircraft without relation to the distance from which the aircraft is viewed.

4,346,431

FIELD CONTROLLED THYRISTOR SWITCHING POWER SUPPLY

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,599
Int. Cl.³ H02M 3/315
U.S. Cl. 363—27 **4 Claims**



1. A switching power supply providing power to an external load comprising:

a field controlled thyristor (FCT);

a first inductor;

commutating means comprising a second inductor and a first capacitor for commutating off said FCT, said first and second inductor being in series with one another with one end of said FCT connected to the junction of said first and second inductor so that current builds up in said first inductor when said FCT is on;

a first diode in parallel with said FCT being reversed biased when said FCT is on;

a second diode to provide energy to said load when the voltage across said FCT jumps due to said first diode blocking current, said second diode having one end connected between said first and second inductances and the other end connected to said load;

filter capacitor means connected across said load;

a third diode connected to permit current to flow from said first inductor to said load when said FCT is off; and

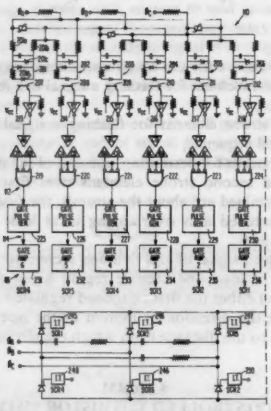
pulse generator means connected to the gate of said FCT for holding said FCT off when said FCT has been commutated off and for subsequently turning said FCT on.

4,346,432

RECTIFIER CONTROLLER RESPONSIVE TO SENSED A.C. VOLTAGE SIGNALS

George P. Gurr, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Atlanta, Ga.

Filed Jul. 2, 1979, Ser. No. 54,025
Int. Cl.³ H02M 7/155
U.S. Cl. 363—129 **22 Claims**



1. A controller for a rectifier of first, second and third phase alternating current voltage signals for supplying a controlled direct current voltage to a load, said rectifier including three pairs of solid state gate controlled rectifying devices connected in a bridge configuration to a common output bus, each of said pair of devices connected to receive one of said first, second or third phase voltage signals to rectify both the positive half and negative half of the respective applied voltage signal, which comprises:

means for detecting comprising voltage detection means for receiving said first, second and third voltage signals and for providing six outputs when respective ones of said voltage signals are greater than ones of the others of said voltage signals; and

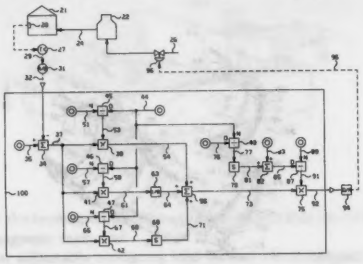
means for providing gate control signals comprising logic means responsive to said six outputs for providing a first set of three gate control signals for indicating which of said voltage signals are most positive at any point in time, and for providing a second set of three gate control signals for indicating which of said voltage signals are most negative at any point in time, said first set of three gate control signals connected to be applied to the gates of one of said devices in each pair, said second set of three gate control signals connected to be applied to the gates of the other of said devices in each pair.

4,346,433

PROCESS CONTROL

Robert W. Rutledge, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1980, Ser. No. 129,295
Int. Cl.³ G06G 7/66; G05B 11/42, 13/04
U.S. Cl. 364—162 **1 Claim**



1. A method for maintaining the value of a controlled process variable substantially equal to a desired value for said controlled process variable, wherein said controlled process variable is responsive to changes in a manipulated process variable, and wherein said process can be represented by a general second order equation of the form

$$G_P(S) = \frac{K_1}{(\tau_1 S + 1)(\tau_2 S + 1)}$$

where

G_P=process transfer function;

K_1=process gain;

τ_1 and τ_2=process time constants; and

S=Laplace operator;

said method comprising the steps of:

establishing a first signal which is representative of the actual value of said controlled process variable;

establishing a second signal representative of the desired value of said controlled process variable;

establishing a third signal representative of the difference (E) between said first signal and said second signal in response to said first signal and said second signal;

supplying said third signal to a process controller having a transfer function given by

$$G_C(S) = \left[\frac{\tau_1 + \tau_2}{2K_1\lambda} + \frac{1}{2K_1\lambda S} + \frac{\tau_1\tau_2 S}{2K_1\lambda}\right]\left[\frac{1}{(\lambda/2)(S) + 1}\right]$$

where

G_C=process controller transfer function;

$\lambda = C(\tau_1 + \tau_2)/2$;

C has a value in the range of about 0.75 to about 1.25; and

τ_1, τ_2, K_1 and S are as previously defined;

said process controller providing a manipulated variable control signal equal to

$$\left[\left(\frac{\tau_1 + \tau_2}{2K_1\lambda}\right)(E) + \left(\frac{E}{2K_1\lambda}\right)\left(\frac{1}{S}\right) + \left(\frac{\tau_1\tau_2 E}{2K_1\lambda}\right)(S)\right]\left[\frac{1}{(\lambda/2(S) + 1}\right]$$

and

manipulating said manipulated variable in response to said

manipulated variable control signal to thereby maintain said controlled process variable substantially equal to the desired value for said control process variable, wherein said method additionally comprises the steps of:

(a) calculating a plurality of values for λ;

(b) substituting a calculated value for λ into the transfer function of said process controller;

(c) noting the response of said controlled process variable to a change in the desired value of said controlled process variable;

(d) repeating steps (b) and (c) until all of the calculated values of λ have been tested; and

(e) selecting the value of λ for which the response of said controlled process variable to a change in the desired value of said controlled process variable most closely approximates a critically damped response to thereby tune said process controller.

4,346,434

APPARATUS FOR CONTROLLING AN ELECTRIC MOTOR

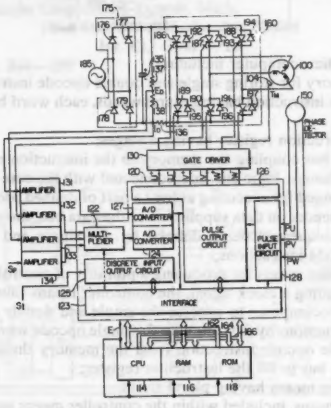
Shigeki Morinaga, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,483

Claims priority, application Japan, Mar. 20, 1979, 54-32571

Int. Cl.³ G06F *15/46*; H02P *5/06*

U.S. Cl. 364—183 **60 Claims**



11. A digital apparatus for controlling an electric motor comprising:

a reference register group including a plurality of reference registers for storing reference data relating to the desired operation of said electric motor;

counter means for selectively producing an increasing or decreasing count value;

comparing means having a first input connected to said reference register group and a second input connected to said counter means for comparing the reference data stored in a selected reference register to the count value of said counter means;

sequencer control means for selectively enabling said reference registers while controlling the increasing and decreasing of said counter means in accordance with a predetermined sequence;

comparison output means for storing the outputs of said comparing means which indicate the comparison result associated with said selected reference registers; and

means for controlling said electric motor on the basis of the data stored in said comparison output means.

4,346,435

PIPELINED INTERPRETIVE DIGITAL DATA PROCESSOR COMPRISED OF A MULTI-LEVEL HIERARCHY OF PROCESSORS

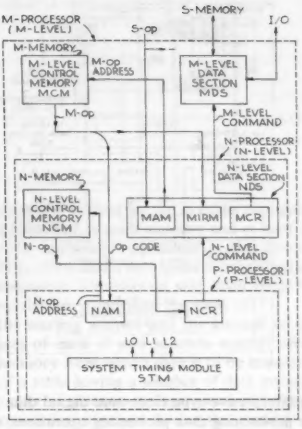
John B. Wise, Banstead, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 23, 1979, Ser. No. 23,342

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ G06F *9/00, 7/00*

U.S. Cl. 364—200 **8 Claims**



1. In an interpretive-type electronic digital data processing system for performing data processing operations, the combination comprising:

a multi-level hierarchy of processors for performing data processing operations, said hierarchy of processors being designatable in descending hierarchical order as S, M, N and P processors and being constructed and arranged such that said M-processor serves as a control section for said S-processor, said N-processor serves as a control section for said M-processor and said P-processor serves as a control section for said N-processor;

said S-processor including an S memory for storing S instructions corresponding to one or more high level languages;

said M-processor including an M memory for storing M instructions;

said N-processor including an N memory for storing N instructions;

means for applying S instructions to said N-processor;

said N-processor including means responsive to an applied S instruction for fetching a selected one or more M instructions from said M memory and for applying the fetched one or more M instructions to said P-processor;

said P-processor including means responsive to a fetched M instruction for fetching a selected one or more N instructions from said N memory and in response thereto producing an N-level command which is applied to said N-processor;

said N-processor being responsive to an applied N-level command for processing a fetched M instruction to produce an M-level command which is applied to said M-processor;

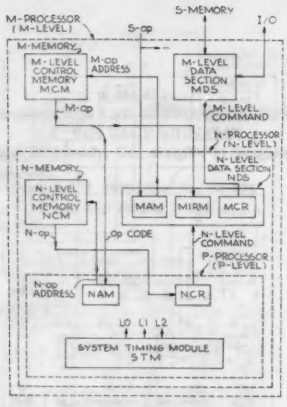
said M-processor being responsive to said M-level command for processing applied data in accordance therewith.

4,346,436

INTERPRETIVE DIGITAL DATA PROCESSOR COMPRISED OF A MULTI-LEVEL HIERARCHY OF PROCESSORS AND HAVING PROGRAM PROTECTION MEANS

John B. Wise, Banstead, England, assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 23,342, Mar. 23, 1979. This application May 3, 1979, Ser. No. 35,588
Int. Cl.[3] G06F *9/38, 9/30, 9/32*
U.S. Cl. 364—200 12 Claims



1. In an interpretive-type electronic digital data processing system for performing data processing operations, the combination comprising:

a multi-level hierarchy of processors for performing data processing operations, said hierarchy of processors being designatable in descending hierarchical order as S, M, N and P processors and being constructed and arranged such that said M-processor serves as a control section of said S-processor, said N-processor serves as a control section for said M-processor and said P-processor serves as a control section for said N-processor;

said S-processor including an S memory for storing S instructions corresponding to one or more high level languages;

said M-processor including an M memory for storing M instructions;

said N-processor including an N memory for storing N instructions;

means for applying S instructions to said N-processor;

said N-processor including means responsive to an applied S instruction for fetching a selected one or more M instructions from said M memory and for applying the fetched one or more M instructions to said P-processor;

said P-processor including means responsive to a fetched M instruction for fetching a selected one or more N instructions from said N memory and in response thereto producing an N-level command which is applied to said N-processor;

said N-processor being responsive to an applied N-level command for processing a fetched M instruction to produce an M-level command which is applied to said M-processor;

said M-processor being responsive to said M-level command for processing applied data in accordance therewith;

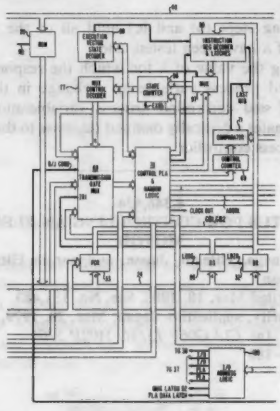
said M-processor also comprising S memory access protection means including a selectively addressable memory containing S memory access rights data which are selectively referenced for each access to said S memory so as to prevent improper access to data stored therein.

4,346,437

MICROCOMPUTER USING A DOUBLE OPCODE INSTRUCTION

Donald E. Blahut, Holmdel, and Richard L. Ukeiley, Marlboro, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1979, Ser. No. 71,712
Int. Cl.[3] G06F *9/22*
U.S. Cl. 364—200 4 Claims



1. A microcomputer including

a memory for storing single and double opcode instructions, each instruction having plural words, each word having n bits;

an instruction register having n stages;

a data bus coupling the memory to the instruction register;

an arithmetic logic unit interconnected with the data bus and arranged for executing at least a part of defined processing sequences on data supplied over the data bus, the processing sequences being defined by the single and double opcode instructions;

controller means for producing a plurality of control signals including a clock signal, the controller means causing the microcomputer to process the single and double opcode instructions by first fetching the single opcode word of the single opcode instruction from the memory through the data bus to fill the instruction register;

latching means having plural states;

logic means, included within the controller means and interconnected with the instruction register and with the latching means, being responsive to the single opcode word of the single opcode instruction stored in the instruction register and to the clock signal produced by the controller means for producing a signal which latches the latching means into a first state indicating that there is sufficient information in the instruction register for prescribing the processing sequence defined by the single opcode instruction;

the controller means including means responsive to the first state of the latching means and to the opcode word of the single opcode instruction currently stored in the instruction register for causing the microcomputer to execute the specific processing sequence defined by the single opcode instruction;

the controller means including means responsive to the microcomputer completing the execution of the processing sequence defined by the single opcode instruction for causing the microcomputer to continue processing the single and double opcode instructions by fetching a first opcode word of the double opcode instruction from the memory through the data bus to fill the instruction register;

the logic means being responsive to the first opcode word of the double opcode instruction now stored in the instruction register and to the clock signal produced by the controller means for producing a signal which latches the latching means into a second state indicating that there is insufficient information stored in the instruction register for prescribing the processing sequence defined by the double opcode instruction;

the controller means including means responsive to the second state of the latching means for causing the microcomputer to fetch a second opcode word of the double opcode instruction from the memory through the data bus to replace the first opcode word in the instruction register before the microcomputer executes the processing sequence defined by the double opcode instruction; and

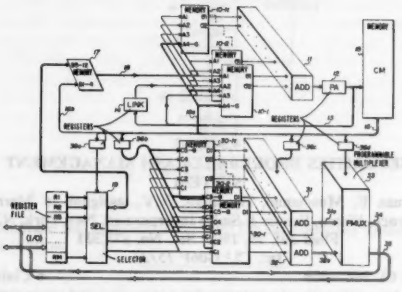
the controller means including means responsive to the second state of the latching means and to the second opcode word of the double opcode instruction currently stored in the instruction register for causing the microcomputer to execute the specific processing sequence defined by the double opcode instruction.

4,346,438

DIGITAL COMPUTER HAVING PROGRAMMABLE STRUCTURE

Hanan Potash, La Jolla; Burton L. Levin, San Diego, and Stephen J. C. Chan, San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 24, 1979, Ser. No. 87,666
Int. Cl.³ G06F 9/26
U.S. Cl. 364—200 **30 Claims**



1. A digital computer having a control section for sequentially generating addresses to a control memory from digital data of any kind, said control section being comprised of:

a plurality of programmable memory means, each of said memory means having first address inputs, second address inputs coupled to receive a portion of the presently active control word from said control memory, and a pair of outputs;

a plurality of register means for storing said digital data, each of said register means having its ith bit coupled to the first address inputs on the ith one of said memory means, where i=1, 2 . . . N, N being the total number of programmable memory means;

each of said memory means including means responsive to the control word portion on its second address inputs for generating signals on its pair of outputs representing programmable arithmetic transformations of the bits on its first address inputs; and

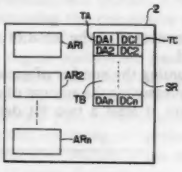
means for combining said signals on said pair of outputs from all of said memory means into said control memory address.

4,346,439

DIRECT MEMORY ACCESS OF A MAIN MEMORY BY AN INPUT/OUTPUT DEVICE USING A TABLE IN MAIN MEMORY

Takakazu Huno, Tachikawa; Takeyuki Endo; Kunihiro Odaka, both of Hinode, and Yasutaka Shibuya, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 109,878
Claims priority, application Japan, Jan. 17, 1979, 54-2969
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 **15 Claims**



1. A data transfer method for use in a data processing system including a processor, a main memory and at least one input-/output device capable of operating in the direct memory access mode to effect direct data transfer from separate storage areas of continuous addresses in said main memory to said input/output device, comprising the steps of:

storing the starting address and the number of continuous addresses of each of said separate storage areas of said main memory from which data is to be transferred in the form of a table having a number of data groups equal to the number of separate storage areas, including transferring to said input/output device the starting address of said table in the main memory and the number of data groups therein, feeding the starting address of said table to said main memory from said input/output device to effect direct data transfer therefrom in accordance with the direct memory access mode, incrementing said starting address of said table at said input/output device in accordance with the number of data groups therein, forwarding the incremented addresses from said input/output device to said main memory for direct memory access mode transfer therefrom, and storing the data transferred from said table in said input/output device;

feeding in succession the starting address of each separate storage area to said main memory from said input/output device to effect direct data transfer therefrom in accordance with the direct memory access mode;

incrementing each starting address at said input/output device in accordance with the stored number of continuous addresses associated with said starting address; and

forwarding said incremented addresses to said main memory for direct memory access mode transfer of data prior to forwarding the next starting address to said main memory.

4,346,440

ADVANCED DATA LINK CONTROLLER

Shikun Kyu, Yokohama, Japan, and Edward C. Hepworth, Chattanooga, Tenn., assignors to Motorola, Inc., Schaumburg, Ill.

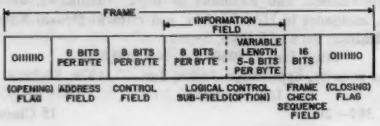
Division of Ser. No. 921,012, Jun. 30, 1978, Pat. No. 4,225,919.
This application Mar. 21, 1980, Ser. No. 132,439
Int. Cl.³ G06F 3/04
U.S. Cl. 364—200 **1 Claim**

1. A data link controller for controlling data communications between a bidirectional data bus and a communications link and for transmitting and receiving data alternatively NRZ or NRZI coded in serial form, said data link controller comprising:

a transmitter;

a receiver;

control means which control the operation of the data link controller when the data link controller is operatively connected to a loop configuration having a plurality of stations, each of which comprises one transmitter and one receiver, wherein the output of a transmitter of a first



station is connected to the input of a receiver of a second station; and

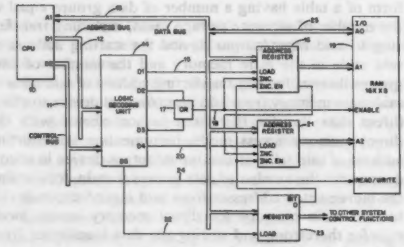
means for counting the number of stations in the loop configuration by measuring the amount of delay in data transmission wherein at least a two bit delay is used for NRZI encoding.

4,346,441

RANDOM ACCESS MEMORY SYSTEM FOR EXTENDING THE MEMORY ADDRESSING CAPACITY OF A CPU

Odas P. Plank; Richard A. Slater, both of Nashua, N.H., and Steven G. Taibbi, Beverly, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 29, 1980, Ser. No. 144,813
Int. Cl.³ G06F *13/06*
U.S. Cl. 364—200 **5 Claims**



1. A random access memory system for extending the memory addressing capacity of a CPU in a data processing system including a control bus, an address bus and a data bus each in electrical communication with said CPU, said memory system comprising:

(a) logic decoding means coupled to said control bus and to said address bus, said logic decoding means being operative in response to control words and a minimum number of memory addresses applied to said CPU to said control bus and said address bus, respectively, to generate command signals for controlling either a data read or a data write operation specified by said control words;

(b) address register means coupled to said logic decoding means and to said data bus, said address register means being conditioned by said command signals to provide memory addresses during both a data read and a data write operation for selectively addressing a single or a series of memory locations

and said address register means including:

first register means coupled to said data bus and to said logic decoding means, said first register means for storing a memory address applied to said data bus by said CPU in response to predetermined ones of said command signals generated by said logic decoding means, said memory address specifying any one of said plurality of memory locations; and,

second register means coupled to said data bus, to said logic decoding means and to said first register means, said second register means storing a control bit signal applied to said data bus by said CPU in response to another one of said command signals, said control bit signal having first and second states for defining whether a single or series of locations are being accessed,

said first register means being operative to selectively increment said memory address in accordance with said first and second states of said control signal for providing said memory addresses for addressing said single or series of memory locations; and

(c) a random access memory coupled to said control bus, said logic decoding means, said address register means and said data bus, said random access memory including a plurality of memory locations and said memory being operative in response to said command signals to store in or supply information from said single or said series of memory locations within said plurality of memory locations specified by said memory addresses received from said first address register means during said data write operation or during said data read operation.

4,346,442

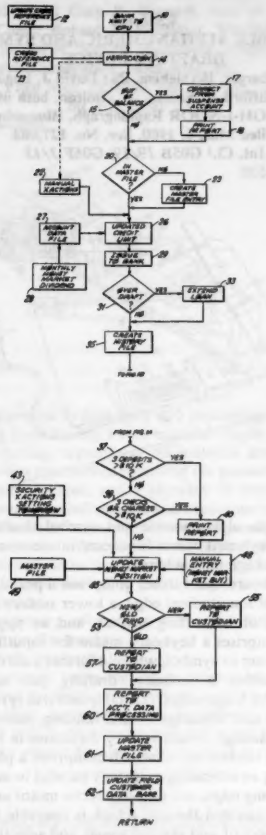
SECURITIES BROKERAGE-CASH MANAGEMENT SYSTEM

Thomas E. Musmanno, Brooklyn, N.Y., assignor to Merrill Lynch, Pierce, Fenner & Smith Incorporated, New York, N.Y.

Filed Jul. 29, 1980, Ser. No. 173,331
Int. Cl.³ G06F *15/21*
U.S. Cl. 364—408 **6 Claims**

1. In combination in a system for processing and supervising a plurality of composite subscriber accounts each comprising a margin brokerage account, a charge card and checks administered by a first institution, and participation in at least one short term investment, administered by a second institution, said system including brokerage account data file means for storing current information characterizing each subscriber margin brokerage account of the second institution, manual entry means for entering short term investment orders in the second institution, data receiving and verifying means for receiving and verifying charge card and check transactions from said first institution and short term investment orders from said manual entry means, means responsive to said brokerage account data file means and said data receiving and verifying means for generating an updated credit limit for each account, short term investment updating means responsive to said brokerage account data file means and said data receiving and verifying means for selectively generating short term investment transactions as required to generate and invest proceeds for subscribers' accounts, wherein said system includes plural such short term investments, said system further comprising means responsive to said short term updating means for allo-

cating said short term investment transactions among said plural short term investments, communicating means to communicate said updated credit limit for each account to said first institution.



4,346,443

REGULATION AND CONTROL SYSTEM FOR THE FUEL FEEDING UNIT OF AN INTERNAL-COMBUSTION ENGINE

Giancarlo De Angelis, Milan; Alberto Catastini, Corsico; Aldo Bassi; Edoardo Rogora, both of Milan; Dario Radaelli, Legnano; Luciano Bertoloni, Milan, and Francesco Perrone, Novara, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

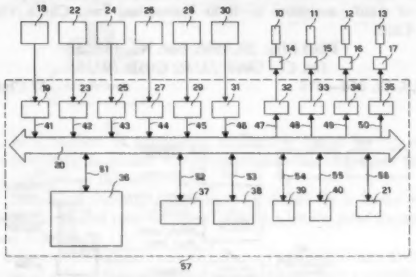
Filed Sep. 8, 1980, Ser. No. 184,630

Claims priority, application Italy, Sep. 10, 1979, 25586 A/79

Int. Cl.³ G06F *15/50*

U.S. Cl. 364—431.04 **2 Claims**

1. A regulation and control system for the unit of fuel feed to an internal combustion engine, said engine being equipped with air intake ducts and actuators for feeding the engine with fuel, said regulation and control system comprising a first detector of a first engine operational parameter, capable of delivering a discrete number of values taken by such a parameter, each of said value being formed by a preselected number of bits, a second detector of a second engine operational parameter capable of delivering a discrete number of values taken by said parameter each of said values consisting of a preselected number of bits, each couple of values of said first and said second parameters defining an engine operational condition, a third detector of an operational temperature of the engine, capable of delivering a discrete number of values taken by such temperature, each of said values consisting of a preselected number of bits, a first pulse generator operatively connected to the mainshaft and capable of delivering at every engine revolution a pulsed signal composed by a number of pulses equal to the number of fuel-dispensing operations which must take place during each engine revolution, a second pulse generator operatively connected to a shaft rotated at half the RPM of the mainshaft and capable of emitting a properly phased pulse at every engine cycle, a central microprocessor unit (CPU), a reading and writing storage unit (RAM), a reading only storage unit (ROM) containing the calculation programs of the microprocessor unit, the carburation plan of the engine as a function of the two engine operational parameters aforesaid, the carburation correction plan as a function of an engine working temperature, the cells of the storage unit (ROM) relative to the carburation plan containing, each, an information for metering the fuel consisting of a preselected number of bits, the value of which is a function of the quantity of fuel to be fed to the engine at every dispensing step, in the operation condition defined by a couple of values of the two engine operational parameters aforesaid, all the other engine operational parameters being assumed constant, the number of the storage cells being equal to the number of the possible combinations of the values taken by a preselected number of most significant bits of the first engine operational parameter and of



the values taken by a preselected number of most significant bits of the second engine operational parameter, the cells of the storage unit aforesaid (ROM) relative to the plan of carburation correction containing, each, an information the value of which is the correction coefficient of the fuel metering as a function of the values taken by said working temperature of the engine, said central microprocessor unit being programmed:

for generating an address of the reading only storage (ROM) composed by the combination of the aforementioned preselected number of the first most significant bits of the numerical value taken by said first engine operational parameter and by the aforesaid preselected number of the first most significant bits of the numerical value taken by the second engine operational parameter;

for identifying by means of such address that cell of the reading only storage in which a first metering information is contained;

for identifying in said reading only storage, in addition to said first metering information three additional metering information pieces, each of which corresponds to the content of the storage cells located in a preselected environmental domain of said address, each of the three cells being identified by algebraically summing certain preselected constants to said address;

for obtaining from the aforesaid four metering information pieces a metering information calculated by an operative

interpolation process, the operative elementary module of which uses a preselected number of the least significant bits of each of said first and said second engine operational parameters;

for identifying in said reading only storage the cell containing the correction coefficient corresponding to the engine working temperature, and for utilizing said correction coefficient to modify said calculated correction information according to a preselected procedure;

for calculating from the thermally corrected metering information the utilized metering information expressed in terms of the control magnitude required by the fuel feeding actuators for the engine, the value of said control magnitude being obtained by calculations based on algorythms depending on the operational features of said actuators, and

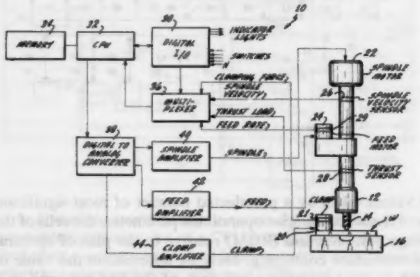
for calculating the instant of command of said fuel feed actuators, utilizing the pulsed signals coming from said first and said second pulse generators, the pulses coming from the first generator being utilized for distinguishing the starting sequential order for the same actuators within a cycle of the engine and for determining the instant of start of each actuator, the pulses coming from the second generator being utilized for defining the beginning of each engine cycle.

4,346,444

CONSTANT THRUST ADAPTIVE CONTROL MACHINE TOOL

Samuel Schneider, San Diego, and John D. Beyer, Poway, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Mar. 20, 1980, Ser. No. 132,252
Int. Cl.³ G06F *15/46;* G05B *19/18*
U.S. Cl. 364—475 **37 Claims**



1. In a metal working machine for moving a cutting tool through a metal workpiece, the combination of:

a spindle including means for carrying a cutting tool therein;

feed drive means for advancing said spindle;

rotation drive means for rotating said spindle;

means for clamping the workpiece in a position to permit the cutting tool to move therethrough;

means for sensing the thrust of the cutting tool against the workpiece and providing an output;

means for sensing the rotational velocity of said spindle and providing an output;

input means responsive to only the input of the hardness of the workpiece material and the diameter of the cutting tool for determining the optimum thrust load of the cutting tool against the workpiece;

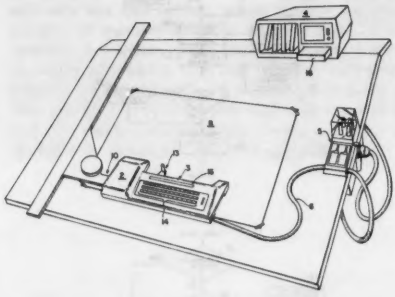
control means coupled to the input means, the rotational velocity sensing means, and the thrust sensing means, and providing an output to the feed drive means and the rotational drive means to rotate and advance the cutting tool carried by said spindle into contact with the workpiece at the predetermined optimum thrust load and providing an output to the clamping means to maintain the clamping force in excess of said predetermined thrust load.

4,346,445

PORTABLE ALPHANUMERIC AND SYMBOL DRAFTING DEVICE

Jean P. Leuenberger, Bethlehem, Pa.; David J. Logan, Glastonbury, and Clifford A. Scorso, Jr., Bolton, both of Conn., assignors to KOH-I-NOOR Rapidograph, Bloomsbury, N.J.

Filed Mar. 6, 1980, Ser. No. 127,663
Int. Cl.³ G05B *19/19;* G06F *3/13*
U.S. Cl. 364—520 **19 Claims**



1. A portable alphanumeric and symbol drafting device comprising a keyboard unit in functional interconnection to an electronics package unit, wherein;

(a) Said keyboard unit further comprises a portable housing with a first longitudinal edge, a lower surface adapted to be placed on a drafting surface, and an upper surface which comprises a keyboard means for inputting at least one character or symbol; wherein further a carriage means for supporting a technical drafting pen is operably mounted for longitudinal (x) and transverse (y) movement proximate said first edge of said housing; means to move said pen carriage in said x and y directions in response to a drawing control signal which comprises a planar member having an extending guideway parallel to said longitudinal housing edge, and an x-axis servo motor and encoder assembly mounted thereon which is operable to respond to one aspect of said control signal, and selectively move said drafting pen carriage, superposed upon said planar member, in the x-direction, parallel to said longitudinal edge; wherein further said y-axis control comprises a y-axis dc servo motor and encoder assembly which is mounted to a base reference of said housing and is operable to respond to a second aspect of said control signal and move said entire planar member assembly in the y-direction, perpendicular to said longitudinal edge; means for raising and lowering said pen carriage means, in a z direction, in further response to said control signal; wherein further,

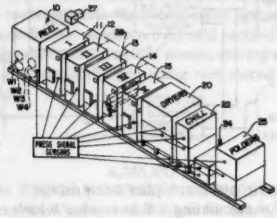
(b) Said electronics package unit further comprises storing memory means for holding addressable, numerical instructions for a vocabulary of characters, means for receiving a character input from said keyboard means and communicating said input to address means for recalling numerical instructions for each of said characters from said vocabulary, means for converting said recalled numerical instructions into a drawing control signal, said converting means communicating with scale means operable to selectively change the scale of a character representation to be executed by said pen, in response to said drawing control signal and means for conveying said drawing control signal through said functional interconnection and to said keyboard unit for controlling said carriage means in said x, y and z directions.

4,346,446

MANAGEMENT AND ANALYSIS SYSTEM FOR WEB MACHINES AND THE LIKE

Robert S. Erbstein; Gary R. Richard, both of New London County, Conn.; Roland T. Palmatier, Washington County, R.I., and Robert W. McGill, Hilversum, Netherlands, assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 25, 1980, Ser. No. 133,770
Int. Cl.[3] G06F *15/46*
U.S. Cl. 364—551 30 Claims



1. A management system for a web processing machine such as a printing press having a web material supply, a plurality of devices for acting repetitively on material drawn from the supply, delivery mechanism receiving the processed material, a drive for said machine, and a plurality of detectors on said machine operable to indicate various occurrences during use of the machine such as correct presence and passage of material, engagement of the drive, on-off impression of the devices, and/or malfunctions or jams in the delivery mechanism;

a control console including a data output device and a data entry device,

a memory storing information to be used during processing of a job on the machine,

an electronic processor,

decoding means receiving inputs from said detectors and providing machine event outputs to said processor,

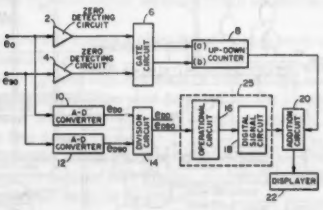
said processor operating to interrogate said machine event outputs and to provide update operating information on said data output device as the machine is operated.

4,346,447

DIVISIONAL READING DEVICE FOR SINE SIGNALS

Akio Takahama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,534
Claims priority, application Japan, Dec. 28, 1979, 54-172199; Dec. 28, 1979, 54-172200; Feb. 25, 1980, 55-21586
Int. Cl.[3] G06J *1/00;* G06G *7/22;* G01D *5/34*
U.S. Cl. 364—560 9 Claims



1. An apparatus for increasing the measurement resolution and accuracy of a position measuring device of the type that employs a detector that provides first and second voltages which vary as sine signals in accordance with the displacement of an object from a predetermined position, the sine signals being 90° out of phase with each other, and that determines the displacement of the object from the predetermined position by counting the number of zero crossings of one of said sine signals, each zero crossing corresponding to a unit of displacement, comprising:

converting means for forming the ratio of said sine signals and for converting the ratio to an output signal representative of a portion of a unit of displacement; and

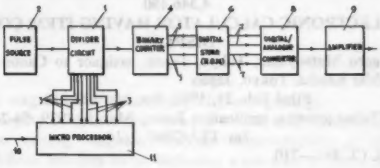
means for combining a signal corresponding to the number of zero crossings obtained by said counting with said signal representative of a portion of a unit of displacement to provide a measurement of displacement that includes the number of units of displacement and a portion of a unit of displacement.

4,346,448

GENERATION OF ELECTRIC SIGNALS HAVING APPROXIMATELY SINUSOIDAL WAVEFORMS

Howard F. Insam, Harrow, and Stephen R. Laurenson, Stanmore, both of England, assignors to The General Electric Company, Limited, London, England

Filed Nov. 23, 1979, Ser. No. 96,841
Claims priority, application United Kingdom, Nov. 23, 1978, 45818/78
Int. Cl.[3] G06F *15/353;* G06J *1/00*
U.S. Cl. 364—607 12 Claims



1. In a method of generating an electric signal having an approximately sinusoidal waveform, said method being of the kind comprising the steps of

(A) frequency dividing a first train of pulses by a factor to derive a second train of pulses having a lower pulse repetition frequency,

(B) utilizing the second train of pulses to address in turn locations of a digital store which stores in digital form a plurality of quantized amplitudes of a sine wave, and

(C) deriving from the signals supplied by the digital store an output signal having an approximately sinusoidal waveform, the improvement comprising:

(D) making a plurality of progressive alterations to the factor by which the frequency of the first train of pulses is divided to form the second train of pulses so as to change the fundamental frequency of the output signal.

4,346,449

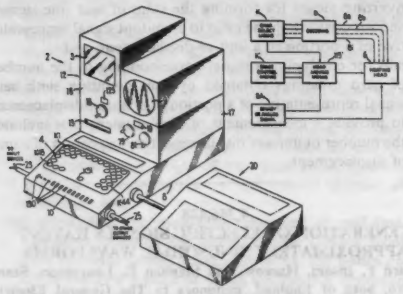
DATA STORAGE AND RETRIEVAL SYSTEM

Stanford R. Ovshinsky, Bloomfield Hills; Peter H. Klose, and Wayne P. Messing, both of Troy, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 724,084, Sep. 16, 1976, Pat. No. 4,205,387. This application Nov. 5, 1979, Ser. No. 91,454
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.[3] G06F *3/12, 15/40;* H05B *1/00;* G01D *15/10*
U.S. Cl. 364—900 32 Claims

1. A recording system for producing microform records, said system comprising: recording means positioned to image selected micro-sized points of an imageable recording material, said recording means including exposed micro-sized dot image-forming points and having electrical signal input terminals adapted to receive electrical image-producing signals for rendering selected ones of said points effective to image said recording material at the points of said recording material

confronting the same to provide a desired image pattern on the recording material, the size of each of said micro-sized image-forming points being no greater than about 20 micron and



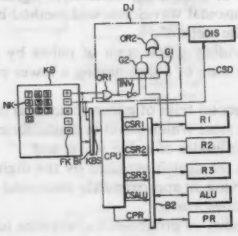
being spaced apart along center points to provide a dot image resolution of at least about 50 dots per millimeter, and operating means for selectively feeding said electrical image-producing signals to said recording means.

4,346,450

ELECTRONIC CALCULATOR HAVING ITEM COUNT DISPLAY

Shigeru Matsuyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1980, Ser. No. 123,210
Claims priority, application Japan, Mar. 3, 1979, 54-24052
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—710 **6 Claims**



1. An electronic apparatus for providing plural information, comprising:

calculation instruction means for generating calculation instructions;

first memory means connected to said calculation instruction means for memorizing a number corresponding to the number of operations of said calculation instruction means;

data input means for entering data;

processor means connected to said calculation instruction means and to said data input means for operating on said entered data in accordance with said calculation instructions to produce a calculation result;

second memory means connected to said processor means for memorizing said calculation result; and

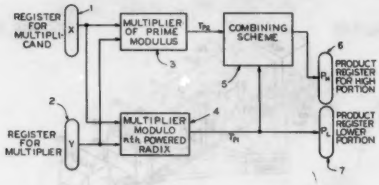
output means connected to said first memory means, to said second memory means and to said calculation instruction means for outputting the content of said first memory means in one drive mode of said calculation instruction means and the content of said second memory means in another drive mode of said calculation instruction means.

4,346,451

DUAL MODULI EXPONENT TRANSFORM TYPE HIGH SPEED MULTIPLICATION SYSTEM

Aisuke Katayama, 2-47, Kawamotomutsumicho, Akita-shi, Akita, Japan

Filed May 23, 1980, Ser. No. 152,681
Claims priority, application Japan, Jun. 1, 1979, 54-67495
Int. Cl.³ G06F *7/52*
U.S. Cl. 364—746 **8 Claims**



1. An asynchronous multiplier comprising:

first means for calculating a first residue which is congruent with a result of a multiplication of a first and a second positive integer with respect to a first modulus which is equal to a prime number, both said first and said second positive integers being represented by an even number of digits;

second means for calculating a first, a second, and a third product by multiplying (a) a lower half of the digits of said first positive integer by a lower half of the digits of said second positive integer, (b) the lower half of the digits of said first positive integer by the digits of a higher half of the second positive integer digits and (c) a higher half of the digits of said first positive integer by the lower half of the digits of said second positive integer, respectively;

first combining means for combining said first through said third products into a second residue which is congruent with the result of the multiplication with respect to a second modulus which is equal to said prime number less one; and

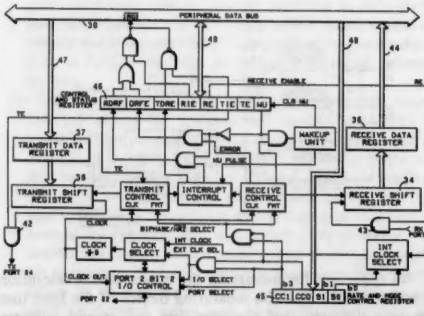
second combining means for combining said first and said second residues into said result of said multiplication.

4,346,452

NRZ/BIPHASE MICROCOMPUTER SERIAL COMMUNICATION LOGIC

Stanley E. Groves, Round Rock, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1978, Ser. No. 939,743
Int. Cl.³ G06F *5/00*; H04L *27/18*
U.S. Cl. 364—900 **4 Claims**



1. In a microcomputer including a processor, serial I/O communication logic and bus means for coupling said proces-

sor to said serial I/O communication logic, said serial I/O communication logic comprising:

control register means coupled to said processor, for storing transmit mode and receive mode signals provided by said processor,

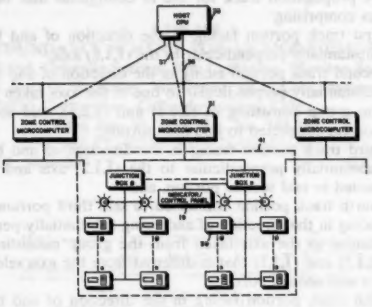
transmitter means coupled to said processor, for receiving and storing data provided periodically by said processor, and for serially transmitting said stored data via a serial output line in either NRZ or biphase format as selected by said transmit mode signal stored in said control register means, and receiver means coupled to said processor, for serially receiving data via a serial input line in either NRZ or biphase format as selected by said receive mode signal stored in said control register means, storing said received data, and periodically providing said stored data to said processor.

4,346,453

ITEM DISPLAY ORDER PICKING SYSTEM

Raoul E. Drapeau, Vienna, and William M. Stone, Reston, both of Va., assignors to Scope Incorporated, Reston, Va.

Filed Nov. 26, 1979, Ser. No. 97,169
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—900 **3 Claims**



1. An item handling system for aiding manual handling of said items by a human operator within a predetermined zone in accordance with output data including order number, quantity and location from a data input device comprising:

a memory means;

control means coupled to the output of said data input device including order number, quantity and location and to said memory means for formatting the data to be stored in said memory means and providing a preselected data output to a line driver means through an interface adapter means;

at least one bay having a plurality of storage areas containing items to be picked;

a display module adjacent each of said storage areas in said predetermined zone and coupled to the output of said control means through said interface adapter means to said line driver means;

a changeable numerical display activated by said control means on each of said display modules for indicating the quantity of items to be picked;

manually operated switch means on said display module for decrementing or incrementing the number indicated on said numerical display; and

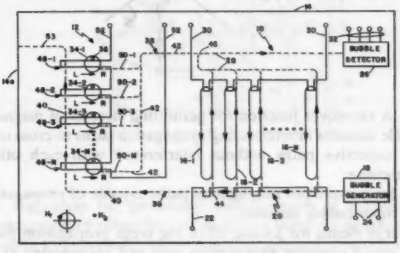
means for interconnecting said switch to said control means through said interface adapter means for transferring information relative to decrementing and incrementing to said control means.

4,346,454

BUBBLE MEMORY WITH ON CHIP ERROR MAP STORAGE ON PERMALLOY DISK ELEMENTS

Peter K. George, Morgan Hill, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 22, 1980, Ser. No. 180,312
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **1 Claim**



1. A magnetic bubble memory chip comprising:

a plurality of data loops, some of which may be defective, for storing magnetic bubbles representative of data therein, the data loops including a plurality of permalloy propagation elements having a predetermined period;

a serial-parallel input path for propagating bubbles to the data loops;

a parallel-serial output path for propagating bubbles from the data loops;

a plurality of permalloy disk elements arranged in spaced-apart linear fashion, each of the disk elements having a diameter substantially equal to the predetermined period, there being an equal number of the data loops and the disk elements, each of the disk elements being adapted for having a single bubble circulated thereabout in the presence of an in-plane rotating magnetic field;

an error map propagation path for propagating bubbles representative of an error map indicating which of the data loops are defective, including a first leg and a second leg, the legs extending past the disk elements on opposite sides thereof, the first leg having one end positioned for receiving bubbles from the serial portion of the serial-parallel input path, and the second leg having one end positioned for feeding bubbles onto the serial portion of the parallel-serial output path;

a plurality of load gates each for transferring a single bubble from the first leg to one of the disk elements, there being an equal number of the load gates and the disk elements; and

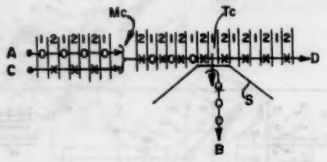
a plurality of read gates each for replicating a single bubble from one of the disk elements onto the second leg, therebeing an equal number of the read gates and the disk elements; and

a control conductor extending adjacent the disk elements, the gates, and the legs of the error map propagation path so that simultaneous parallel storing of bubbles on the disk elements and thereafter simultaneous parallel access to bubbles stored on the disk elements is obtained upon consecutively applying predetermined load and read signals to the control conductor.

4,346,455
CROSSOVER JUNCTION FOR MAGNETIC BUBBLE DOMAIN CIRCUITS

Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 886,972, Mar. 15, 1978, abandoned.
This application Aug. 27, 1979, Ser. No. 70,237
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—16 10 Claims



1. A crossover junction for permitting streams of magnetic bubble domains in intersecting propagation paths to cross over the respective paths without interference with each other, comprising:

at least two input propagation paths capable of propagating input bubble domains,

merge means for joining all of the input propagation paths into a common propagation path and propagating all of the input domains from each of said input propagation paths such that the input bubble domains are interleaved on said common propagation path,

at least one output propagation path separate from and adjacent to said common propagation path, and

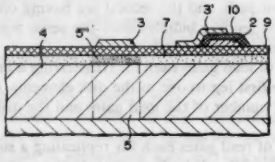
active transfer switch means selectively joining said common propagation path and said output propagation path

wherein separate output bubble domains representative of the input bubble domains from a selected input propagation path can be taken from the common propagation path and supplied to said output propagation path in response to the operation of said transfer switch means whereby input bubble domain streams on said input propagation paths can effectively cross each other without interference.

4,346,456
MAGNETIC BUBBLE DEVICE

Ryoichi Kinoshita, and Shobu Orihara, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 22, 1979, Ser. No. 68,626
Claims priority, application Japan, Aug. 30, 1978, 53-105983
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 6 Claims

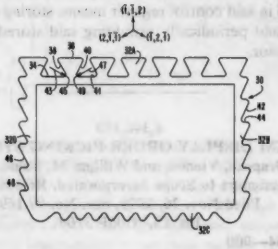


3. A magnetic bubble device comprising a magnetic thin film serving as a medium for propagation of a magnetic bubble and having first, second and third regions which are formed by first, second and third ion implantation processes, respectively, wherein said first and third ion implantation processes are the same, wherein said second ion implantation process is different from said first ion implantation process, and wherein said first and third regions are bubble propagation paths and said second region formed to prevent strip out of a bubble is a strip-like region between said bubble propagation paths.

4,346,457
DOVETAIL PROPAGATION STRUCTURE FOR CONTIGUOUS DISK BUBBLE DEVICES

Hung L. Hu, Sunnyvale, and Kochan Ju, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,185
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 8 Claims



1. A propagation track for use in contiguous disk bubble devices comprising

a first track portion facing in the direction of and being substantially perpendicular to the $(\bar{1},\bar{1},2)$ axis,

a second track portion facing in the direction of and being substantially perpendicular to one of the axes taken from the group consisting of $(2,1,\bar{1})$ and $(\bar{1},2,\bar{1})$, said second portion connected to said first portion,

a third track portion facing in the direction of and being substantially perpendicular to the $(\bar{1},\bar{1},2)$ axis and connected to said second portion, and

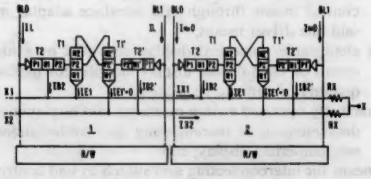
a fourth track portion connected to said third portion and facing in the direction of and being substantially perpendicular to the axis taken from the group consisting of $(2,\bar{1},\bar{1})$ and $(\bar{1},2,\bar{1})$ that is different from the axis selected for said second portion,

a fifth track portion facing in the direction of and being substantially perpendicular to the $(\bar{1},\bar{1},2)$ axis, and connected to said fourth portion.

4,346,458
I^2L MONOLITHICALLY INTEGRATED STORAGE ARRANGEMENT

Horst H. Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1980, Ser. No. 177,348
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944141
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—174 14 Claims



1. A monolithically integrated storage arrangement with

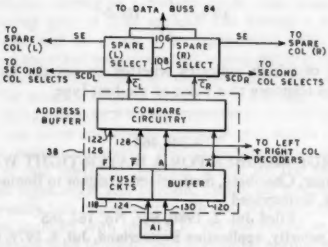
storage cells arranged in a matrix, which comprise two I^2L structures each made up of an injector (P1, P1') and an associated inverting transitor (T1, T1') and connected in the form of a flip-flop by a cross-coupling between the collector (N2 and N2', respectively) of one transistor and the base (P2' and P2, respectively) of the other inverting transistor, the operating current and the read/write currents of the storage cells of a matrix column being applied via a bit line pair (BL0, BL1) connected to the injectors (P1, P1') of said storage cells, and the selection of the storage cells of a matrix line being effected via a common address line (X) coupled to the emitters (N1, N1') of the inverting transistors (T1, T1') of said storage cells, characterized in that the emitters (N1) of the inverting transistors (T1) of one I^2 *L structure of the storage cells of each matrix line are connected to a first partial address line (X1) and the emitters (N1') of the inverting transistors (T1') of the other* I^2L structure are connected to a second partial word line (X2), and that each of the two partial address lines (X1, X2) subsequent to each group of storage cells (1 to m) is connected to the common address line (X) via a resistor (RX).

4,346,459

REDUNDANCY SCHEME FOR AN MOS MEMORY

Rahul Sud, Colorado Springs; Kim C. Hardee, Manitou Springs, and John O. Heightley, Monument, all of Colo., assignors to INMOS Corporation, Colorado Springs, Colo.

Filed Jun. 30, 1980, Ser. No. 164,282
Int. Cl.³ G11C *8/00, 29/00, 11/40*
U.S. Cl. 365—200 **22 Claims**



1. In an MOS memory chip having an array of memory cells adapted to be tested by a probe test operation which identifies defective memory cells and generates a signal for use in replacing defective memory cells, a redundancy scheme for substituting spare memory cells for cells found to be defective by the probe test, comprising:

a plurality of spare memory cells;

on-chip address control means electrically responsive to the signal generated during probe test for permanently storing and for rendering continuously available a fully asynchronous electrical indication of the addresses of defective memory cells, for comparing incoming memory address information received after testing with the address of defective memory cells, and for generating a control signal indicative of the receipt of memory address information corresponding to the address of a defective memory cell; and

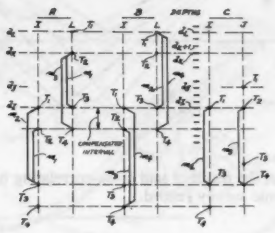
selection means responsive to the control signal for electrically accessing a spare memory cell and for prohibiting access to the defective memory cell.

4,346,460

METHOD AND APPARATUS FOR DERIVING COMPENSATED MEASUREMENTS IN A BOREHOLE

Nick A. Schuster, Darien, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 922,114, Jul. 5, 1978. This application May 21, 1980, Ser. No. 152,075
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—27 **37 Claims**



1. Apparatus for producing measurements of a physical characteristic of subsurface media near a borehole penetrating the earth to provide for a borehole compensated measurement, comprising:

an elongated support member;

transducers of a first type supported by said member and separated along said member by a preselected separation along a line generally parallel to the elongation of said member;

transducers of a second type supported by said member and separated along said member by said preselected separation along said line, said second type transducers located along said line on one side of said first type transducers and said transducers of said first and second types having respective common operating characteristics; and

means for producing measurements of said physical characteristic of subsurface media using combinations of said first and second type transducers at selected borehole positions for obtaining repetitive measurements of said physical characteristic for a selected interval of borehole depth.

4,346,461

SEISMIC EXPLORATION USING VIBRATORY SOURCES, SIGN-BIT RECORDING, AND PROCESSING THAT MAXIMIZES THE OBTAINED SUBSURFACE INFORMATION

Francis Muir, Laguna Niguel, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 1, 1980, Ser. No. 117,689
Int. Cl.³ G01V *1/20, 1/36*
U.S. Cl. 367—39 **16 Claims**

1. A method of seismic surveying using vibratory sources that recovers all the essential information of full-waveform recording even though said method uses only sign-bit recording of both the source signals and the detected signals, which comprises:

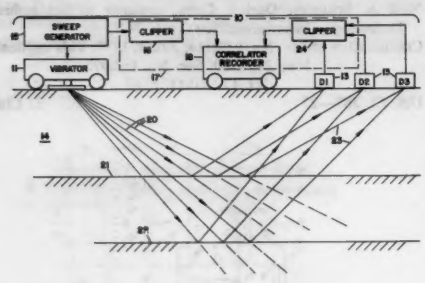
A. injecting seismic vibrations into the earth by driving at least one substantially linearly-responding vibratory source with a substantially Gaussian, zero mean, stationary code;

B. recording a sign-bit representation of said substantially Gaussian, zero mean, stationary code;

C. recording a sign-bit representation of the seismic vibrations that have propagated through the earth from said at least one vibratory source to at least one receiver; and

D. cross-correlating said sign-bit representation of said sub-

stantially Gaussian, zero mean, stationary code with said sign-bit representation of the received said seismic vibrations; the result of said cross-correlating being the desired seismic survey record.

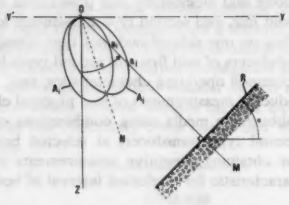


4,346,462

SEISMIC PROSPECTING METHOD PROVIDING FOR THE DETERMINATION OF THE FLANK DIP OF SUBTERRANEAN LAYERS AND DEVICE FOR CARRYING OUT THE SAME

Benoit T. du Boullay, Sevres, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jan. 26, 1978, Ser. No. 872,361
Claims priority, application France, Jan. 28, 1977, 77 02690
Int. Cl.[3] G01V *1/30*
U.S. Cl. 367—61 **21 Claims**



1. A seismic prospecting method for determining the flank dip of subterranean layers in a medium reflecting acoustic waves, with respect to the plane of a seismic profile by using a transmitting device capable of transmitting acoustic waves through the medium on survey according to a plurality of different directivity diagrams comprising:

sequentially actuating the transmitting device a plurality of times while changing the directivity diagram for each of said plurality of times;

sequentially receiving the waves reflected by reflecting layers of said medium in a plurality of reception points arranged along a line substantially parallel to the profile plane;

recording the echoes, on said reflecting layers, of the acoustic waves transmitted according to each of the directivity diagrams;

and

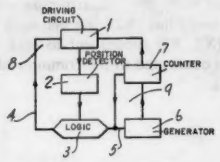
processing the recorded signals, said processing comprising combining the transmitted acoustic intensities according to a predetermined relationship for each transmission direction in each of the directivity diagrams of the transmission device to form a first combination, combining the respective values of at least one parameter representing the intensity of the reflected acoustic waves recorded on the recordings corresponding to the different directivity diagrams according to the same predetermined relationship to form a second predetermined combination, and comparing the results of the two combinations to determine the flank dip.

4,346,463

MOVEMENT DETECTOR FOR A STEPPING MOTOR

Mai Tu Xuan, Chavannes; Marcel Jufer, Morges, both of Switzerland, and Andre Pittet, Bangalore, India, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Jun. 23, 1980, Ser. No. 162,227
Claims priority, application France, Jun. 21, 1979, 79 16816
Int. Cl.[3] G06F *1/04*; H02P *1/40*
U.S. Cl. 368—157 **4 Claims**



1. A feed arrangement for a single phase timepiece stepping motor arranged to control the functioning of the motor by means of a first type of bipolar pulses of relatively small width or by a second type of bipolar pulses of greater width, a series of pulses of the second type being applied to the motor whenever said motor has failed to step in response to pulses of the first type wherein there is provided a step detector including first means arranged to sample a first signal Ud developed by the current through the motor winding and second means arranged and adapted to generate a second signal

$$Uc = \int_0^T Ud\,dt$$

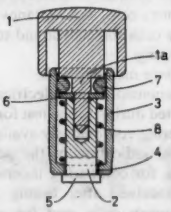
the level of which indicates whether or not the motor has stepped in response to a pulse of the first type.

4,346,464

CONTROL MEMBER FOR A WATER-TIGHT WATCH

Karl Wenger, Chambesy, Switzerland, assignor to Boninchi S.A., Geneva, Switzerland

Filed Jul. 2, 1980, Ser. No. 165,265
Claims priority, application Switzerland, Jul. 4, 1979, 6226/79
Int. Cl.[3] G04B *37/00*
U.S. Cl. 368—289 **7 Claims**



1. A control assembly for a water-tight watch of small dimensions having a case, comprising:

a tube adapted to be fixed water-tight to the case of a watch and to extend outwardly from said case,

a control member having a head portion and a stem portion

freely received in said tube for movement of said control member relative to said tube,

means defining an annular recess in said stem portion opening toward the inside of said tube and having a bottom wall and parallel axially spaced radial side walls lying in planes perpendicular to said tube, and

a resilient annular packing in said recess, said packing being compressed in an axial direction between said parallel radial side walls of said recess, engaging an inner surface of said tube and having a free side spaced with a radial clearance from said bottom wall of said recess.

4,346,465

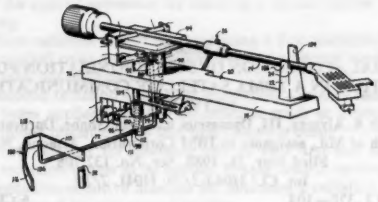
AUTOMATIC RECORD PLAYER

James T. Dennis, P.O. Box 15100, Oklahoma City, Okla. 73155, and George Kolomayets, Chicago, Ill., assignors to James T. Dennis, Oklahoma City, Okla.

Division of Ser. No. 9,254, Feb. 5, 1979, Pat. No. 4,291,886, which is a continuation of Ser. No. 813,225, Jul. 5, 1977, abandoned. This application Dec. 1, 1980, Ser. No. 211,837

Int. Cl.³ G11B *17/06, 19/06*

U.S. Cl. 369—230 **13 Claims**



3. In an automatic record player, the combination of, a tone arm, means for mounting the tone arm for rotation about a fixed point, a main cycling gear, means for rotating said gear one revolution during an automatic cycle, cam means on said main cycling gear, a tone arm lift rod having a horizontal portion one end of which is in engagement with said cam means and the other end of which is connected to a right-angle end portion, bearing means for mounting said right-angle end portion for rotation about a vertical axis, said right-angle end portion being positioned so that movement thereof along said vertical axis raises and lowers said tone arm, means defining a shoulder positioned above and extending generally transversely of said horizontal portion of said lift rod and spaced from said right-angle end portion, means for biasing said lift rod upwardly into engagement with said shoulder, said shoulder being inclined with respect to the horizontal so that said biasing means tend to rotate said horizontal portion about said bearing means and move said right-angle end portion along said vertical axis, said biasing means also acting to bias said one end of said horizontal portion into engagement with said cam means, said cam means controlling rotation of said horizontal portion about said bearing means and vertical movement of said right-angle end portion during an automatic cycle.

4,346,466

COMPENSATOR FOR HORIZONTAL ANGULAR ERROR OF A RECORD-PLAYER ARM

Peter K. Kanchev, Sofia, Bulgaria, assignor to Bulgarsko Radio, Sofia, Bulgaria

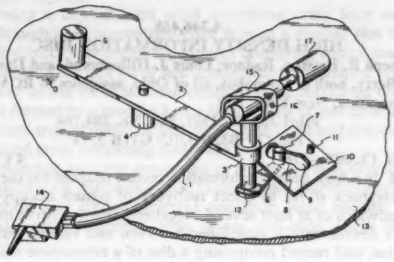
Filed Jun. 2, 1980, Ser. No. 155,134

Claims priority, application Bulgaria, May 31, 1979, 43792

Int. Cl.³ G11B *3/38*

U.S. Cl. 369—250 **1 Claim**

1. A compensator for the horizontal angular error of a conventional playing arm of a disc record player having a base frame, comprising a bearing lever freely rotating about an intermediate point thereof in a horizontal plane upon a vertical axis, a vertical shaft rotatably mounted on the bearing lever at one end thereof, the playing arm being mounted for oscillation in a vertical plane on the upper end of said shaft and for rotation therewith in a horizontal plane, a counter-load statically balancing the whole system including the vertical shaft and the playing arm, said counter-load being mounted on the other end of the bearing lever, a compensating lever fixedly connected to the lower end of the shaft which supports the playing arm, said compensating lever extending radially from said shaft in a direction with respect to the length of the bearing lever which



is opposite to the direction at which the center of the record lies with respect to the length of the bearing lever, a roller which freely rotates about a vertical axis mounted on the outer end of the compensating lever, and a horizontally disposed cam plate having a shaped slot therewithin, such slot accurately guidingly receiving the roller, and means adjustably affixing the cam plate to the base frame of the record player, said last named means including a screw by which the cam plate is affixed to the base frame and about which the cam plate is angularly adjustable.

4,346,467

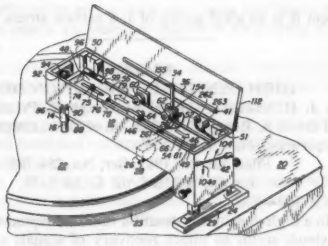
LINEAR TRACKING TONE ARM

Louis C. Souther, 429 York St., Canton, Mass. 02021

Filed Dec. 29, 1980, Ser. No. 220,422

Int. Cl.³ G11B *3/36*

U.S. Cl. 369—249 **24 Claims**



1. A linear-tracking tone arm mechanism for a record turntable, said mechanism comprising:

a housing having means for engaging the spindle of a turntable and means for mounting to the turntable which supports said housing above the turntable;

an elongate generally horizontal track assembly mounted to said housing and extending longitudinally in the direction generally between said means for engaging and said means for mounting and having a forward track and a parallel rearward track horizontally spaced from and slightly higher than said forward track;

a carriage including first and second rear bearings having a first surface for engaging the top of said rear track and a second surface for engaging the side of said rear track opposite said forward track and a forward bearing having

a first surface for engaging the top of said forward track and a second surface for engaging the side of said forward track opposite said rear track; said second surface of said rear bearings being spaced from said second surface of said forward bearing a greater distance than said forward track is spaced from said rearward track to enable said second surface of said forward bearing to remain clear of said forward tracks;

a tone arm; and

means for mounting said tone arm to said carriage.

4,346,468

HIGH DENSITY INFORMATION DISC

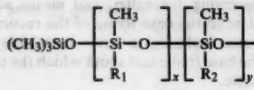
Joseph R. Preston, Radnor; Louis J. Hillenbrand, and David A. Berry, both of Columbus, all of Ohio, assignors to RCA Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,784

Int. Cl.³ B32B *3/02;* G11B *5/74*

U.S. Cl. 369—276 **4 Claims**

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula:



wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises said lubricant containing a tetrakis(dialkylamino)silane of the formula:

$$Si[N-(R)_2]_4$$

wherein R is an alkyl group of 1–5 carbon atoms.

4,346,469

HIGH DENSITY INFORMATION DISC

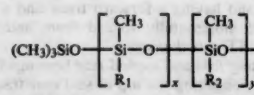
Louis J. Hillenbrand, Columbus; Joseph R. Preston, Radnor, and David A. Berry, Columbus, all of Ohio, assignors to RCA Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,785

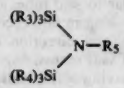
Int. Cl.³ B32B *3/02;* G11B *5/74*

U.S. Cl. 369—276 **4 Claims**

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula



wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises adding to said lubricant a hexaalkyldisilazane additive of the formula



wherein R_3 and R_4 independently are alkyl groups of 1–5 carbon atoms and R_5 is selected from the group consisting of hydrogen or alkyl of 1–5 carbon atoms.

4,346,470

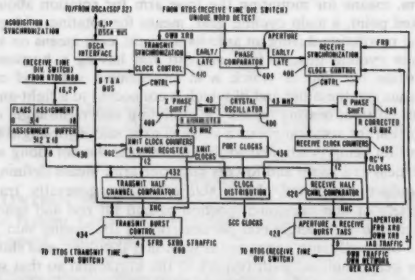
INITIAL ACQUISITION OF SYNCHRONIZATION FOR A STATION IN A TDMA SATELLITE COMMUNICATION NETWORK

Joseph A. Alvarez, III, Damascus, and John Shabe, Darnestown, both of Md., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,708

Int. Cl.³ H04J *3/16;* H04L *7/10*

U.S. Cl. 370—104 **6 Claims**



2. A method for acquiring transmit synchronization at a secondary station with the periodic frame reference bursts from a reference station in a TDMA network, comprising the steps of:

bursting an initial acquisition burst from said secondary station during a relatively wide interval in the traffic portion of a TDMA frame and measuring a propagation delay factor;

adding said propagation delay factor to the receive frame timing synchronized with the reception of said frame reference bursts at said secondary station to obtain a finely adjusted transmit frame timing;

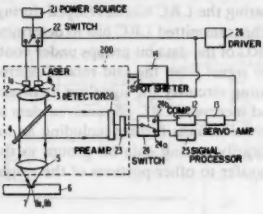
bursting a transmit reference burst from said secondary station during a relatively narrow interval in the control portion of periodic, non-consecutive ones of said TDMA frames and measuring a propagation delay correction factor;

adjusting the phase of said transmit frame timing with said correction factor to maintain synchronization of said secondary station with said reference station.

4,346,471
OPTICAL APPARATUS FOR TRACKING A RECORD CARRIER

Kazuo Hirasawa, and Takahiro Kubo, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1980, Ser. No. 156,227
Claims priority, application Japan, Jun. 4, 1979, 54-70888
Int. Cl.³ G11B *7/00*; H04N *5/76*
U.S. Cl. 369—44 **7 Claims**



1. An optical apparatus for tracking a record carrier comprising:

a first radiation source for generating a first radiation beam applied onto an information track of a record carrier to read out information;

a second radiation source for generating a second radiation beam applied onto the information track at a predetermined distance from said first radiation beam;

a first selector for selecting one of said first and second radiation beams to be applied to said record carrier;

a radiation-sensitive detector for detecting a radiation beam reflected by said record carrier;

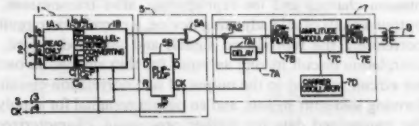
a second selector coupled with said radiation-sensitive detector and operating in synchronysm with said first selector to periodically select the reflected radiation caused by said second radiation beam; and

shifting means coupled with said second selector for adjusting the position of an optical system comprising said first and second radiation sources in response to an amplitude difference between the output of said second selector and a reference signal level in order to follow said information track.

4,346,472
METHOD AND APPARATUS FOR ELIMINATING DOUBLE BIT ERROSION IN A DIFFERENTIAL PHASE SHIFT KEYING SYSTEM

Seiei Ohkoshi; Isao Ishikawa; Teiji Okamoto, all of Yokohama, and Nobuo Tsukamoto, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 176,205
Claims priority, application Japan, Aug. 10, 1979, 54-101280
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **7 Claims**



1. An information coding method usable in a digital data transmission system for transmitting digital data in frames containing n bits with each frame including error correcting code bits and information bits modulated by differential phase shift keying, comprising the steps of:

forming for each frame of digital data an individual code for transmission in such a manner that a first transmitted bit of said code for transmission is made equal to a first bit of said error correcting code and an i-th transmitted bit ($2 \leqq i \leqq n$) of said code for transmission is formed by a modulo 2 sum of the i-th and (i−1)th bits of said error correcting code;

modulating said code for transmission by differential phase shift keying;

transmitting said modulated code;

demodulating said transmitted code by differential phase shift keying;

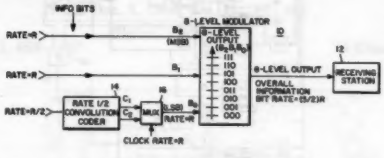
forming a demodulated error correcting code from said demodulated transmitted code in such a manner that the first bit of said demodulated error correcting code is made equal to the first bit of said demodulated transmitted code and an i-th bit of said demodulated error correcting code is formed by a modulo 2 sum of an i-th bit of said demodulated transmitted code and an (1−1)th bit of said demodulated error correcting code; and

performing an error correcting operation on said demodulated error correcting code to regenerate said information code, said error correcting operation being peculiar to said error correcting code having said code length of n bits.

4,346,473
ERROR CORRECTION CODING METHOD AND APPARATUS FOR MULTILEVEL SIGNALING

Robert C. Davis, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 26, 1980, Ser. No. 125,084
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—43 **44 Claims**



20. A system for encoding an information bit stream having a most significant bit and at least one lower significant bit for transmission over a transmission channel to a receiving station, comprising:

means for converting at least one of said lower significant bits in the bit stream into a pair of code branch bits T_1 and T_2 without encoding the most significant bit;

means for using each code branch bit pair to select one of a group of baseband voltages for transmission to the receiving station,

wherein a plurality of the transmitted baseband voltages produce a code path, and wherein the minimum distance between any two code paths is:

$$d_{code} = 6\sqrt{\frac{E_b}{5}} .$$

4,346,474
EVEN-ODD PARITY CHECKING FOR SYNCHRONOUS DATA TRANSMISSION

Daniel T. W. Sze, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,581
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **7 Claims**

1. A synchronous transmission system for transmitting, receiving, and checking data bit groups arranged in succeeding

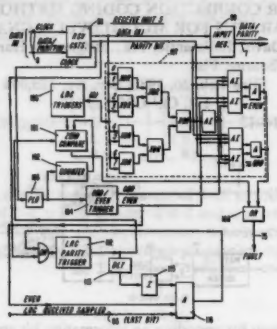
frames, each frame typically consisting of a multiplicity of data bit groups, comprising:

a transmission line;

a plurality of stations selectively interconnected for data communications via said transmission line;

a controller at each of said stations, each of said controllers controlling data storage, data transfer, data transmit, data receive, and data checking operations at its respective station, and each of said controllers including a random access memory/register block serving as a buffer storage for control information and data, a data bus buffer serving as a buffer storage for data transferred to and from an external source, control logic for controlling storage accessing and read/write operations of its respective station, and a data bus in said controller interconnecting said memory/register block, said data bus buffer and said control logic;

a controller microprocessor incorporated in each of said controllers for monitoring and analyzing information transmitted and received at its respective station and for developing and recognizing control signals, each of said controller microprocessors including an internal bus for transmittal of information and commands internally within said microprocessor, an arithmetic logic unit having an associated accumulator and a plurality of registers including an instruction register for storing instructions, a decode and control block for developing operations signals from instructions in said instruction register, a transmit block for processing byte, count and control functions during transmission of data and for providing even and odd parity signals and a gate LRC signal, a receive block for processing byte count and control functions during receipt of data, said receive block also providing a longitudinal redundancy check (LRC) sample signal;



a data transmit unit incorporated in each of said controllers, each of said data transmit units being interconnected with the related microprocessor of its respective controller for transmitting data responsive to control signals from the said related microprocessor, each of said data transmit units including a data/parity register for temporarily storing said data bit groups, an even-odd parity circuit for generating even and odd vertical redundancy parity check (VRC) bits for the data bit groups stored in said data/parity register under control of said even and odd parity signals from the said related microprocessor, a longitudinal redundancy check (LRC) circuit for generating longitudinal redundancy check bits for all bit positions of individual frames of data bit groups under control of said gate LRC signal from the said related microprocessor, and each of said data transmit units further including drive circits to supply output signals to said transmission line representative of said data bit groups, even-odd parity check bits and LRC bits during transmission of data; and

a data receive unit incorporated in each of said controllers, each of said data receive units being interconnected with the related microprocessor of its respective controller for receiving and checking data from any of said transmit units on a selective basis responsive to control signals from the said related microprocessor, each of said data receive units including receive circuits for receiving signals from said transmission line representative of said data bit groups, said even-odd parity check bits and said LRC bits, a parity check circuit for analyzing data bit groups and even-odd check bits for correct even or odd parity during receipt of data under control of signals from the related microprocessor, an LRC checking circuit for analyzing the LRC characteristics of data in successive frames and comparing the LRC bits developed during receipt of data with the transmitted LRC bits to determine correctness of the LRC of the data bit groups under control of said LRC sample signal from the said related microprocessor, fault indicating circuitry for signaling incorrect even-odd parity and incorrect LRC of received data and each of said data receive units further including an input register for temporarily storing data bit groups as they are received for transfer to other portions of the respective station.

4,346,475

DATA TRANSMISSION SYSTEM OPERATING ON THE SPREAD SPECTRUM PRINCIPLE

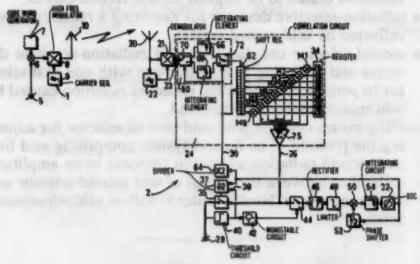
Roger P. J. Alexis, Neuilly-sur-Seine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,285

Claims priority, application France, Jul. 13, 1979, 79 18259

Int. Cl.[3] H04B *1/12, 15/00*; H04K *1/04*

U.S. Cl. 375—1 **3 Claims**

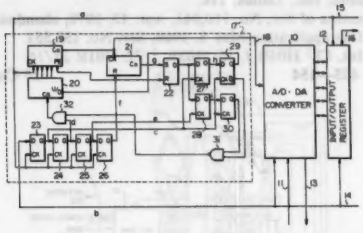


1. A data transmission system operating on the spread system principle, the system consisting, on the one hand, of a transmitting portion having a terminal for receiving data to be transmitted at two levels, an ajdusting device for generating a spreading code word corresponding with the first level, this code word being selected from among the code words D, and an inverted version of said code word corresponding with the second level, and a transmission circuit for transmitting the output signals of the adjusting device through a transmission channel and, on the other hand, of a receiving portion comprising a receiving circuit for receiving the signals from the transmission channel and for reproducing, after transmission, the output signals of said adjusting device, a correlation circuit for correlating the reproduced signals and said code word, the correlation circuit having an input for shift signals, an oscillator circuit coupled to the output of said correlation circuit for forming said shift signals, and an output terminal for supplying the transmitted data for further processing, characterized in that there is provided, between the output of the correlation circuit and the output terminal of the receiving portion, a gate circuit which is controlled from the signals produced by the oscillator circuit in order to be rendered conductive for each shift which is equal to an even number of times the duration of a binary element forming the spreading code word.

4,346,476
A/D, D/A CONVERTER FOR PCM TRANSMISSION SYSTEM

Masao Yamasawa, Sagamihara; Michinobu Ohhata, Kawasaki, and Toshi Ikezawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 23, 1980, Ser. No. 152,556
Claims priority, application Japan, May 30, 1979, 54-66121
Int. Cl.[3] H04L 7/04
U.S. Cl. 375—8 9 Claims



1. A codec for a PCM transmission system for converting analog signals to serial digital signals for transmission by the PCM system and for converting serial digital signals received by the PCM system to analog signals, said codec being responsive to frame pulses of a predetermined frequency defining the rate of sampling of the analog signal, the conversion of digital words corresponding to analog samples to serial digital signals and the reverse conversion of serial digital signals as received to digital words for conversion to analog signals, and to read/write clocks of a predetermined frequency defining the timing of the conversion of parallel digital signals of said digital words to serial digital signals for transmission and the reverse conversion thereof, comprising:

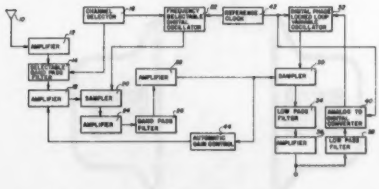
a digital phase locked loop circuit for generating internal operation clocks by dividing the frequency of said read/write clocks by a value which is determined in accordance with the frequency ratio between said frame pulses and said read/write clocks, and

an a/d and d/a conversion means responsive to said frame pulses and said internal operation clocks, for coding an analog signal to a PCM digital signal for transmission and for decoding a received PCM digital signal to an analog signal.

4,346,477
PHASE LOCKED SAMPLING RADIO RECEIVER

Robert S. Gordy, Largo, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Aug. 1, 1977, Ser. No. 820,866
Int. Cl.[3] H04B 1/16; H03J 7/02
U.S. Cl. 455—257 25 Claims



1. A radio receiver in which a first signal is frequency translated to produce a second signal, comprising:

(a) means for generating a first clock signal,

(b) means responsive to a control signal for generating a second clock signal by adding clock pulses to said first clock signal,

(c) means responsive to said control signal for generating said second clock signal by deleting clock pulses from said first clock signal,

(d) means for generating a sampling clock signal by dividing the rate of said second clock signal,

(e) means for sampling said first signal at the rate of said sampling clock signal to frequency translate said first signal thereby generating the second signal which includes a carrier component,

(f) means for extracting said carrier component from said second signal,

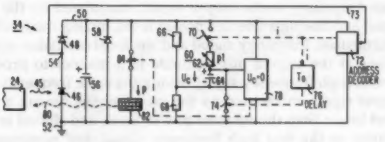
(g) means for generating said control signal responsive to a phase difference between said carrier component and a third signal having a predetermined frequency, and

(h) means for phase locking said carrier component to said third signal by varying the rate of said sampling clock signal in response to said control signal.

4,346,478
FIBER OPTICAL SENSOR SYSTEM, PREFERABLY FOR MEASURING PHYSICAL PARAMETERS

Georg H. Sichling, Corvallis, Oreg., assignor to Siemens Corporation, Iselin, N.J.

Filed Dec. 1, 1980, Ser. No. 211,681
Int. Cl.[3] H04B 9/00
U.S. Cl. 455—612 32 Claims



1. A fiber optical sensor system for transmission of information from one location to another, comprising in combination:

(a) a fiber optical transmission line having a first end and at least one second end for transmitting light therebetween,

(b) a first light source for emitting a first light beam into said first end of said transmission line;

(c) at least one first receiver element sensitive to the light of said first light source for receiving light of said first light source from said second end of said transmission line and for generating a first electric output signal in accordance with the light received;

(d) electrical energy storage means connected to said first receiver element for receiving said first electric output signal and for storing energy in accordance therewith;

(e) a second light source for emitting a second light beam into said second end of said transmission line, said second light source being energized from said electrical energy storage means and being controlled in dependence upon information to be transmitted; and

(f) a second receiver element sensitive to the light of said second light source for receiving light of said second light source from said transmission line and for generating a second electric output signal in accordance with the light received and thereby in accordance with the transmitted information.

4,346,479

COMPENSATION FOR TRANSMISSION ELEMENT NONLINEARITIES IN A RADIO RELAY TRANSMISSION SYSTEM

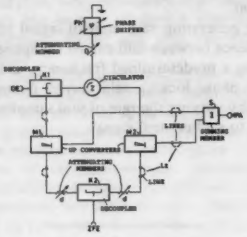
Herbert Weber, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 157,172

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923046

Int. Cl.³ H04B *1/66, 15/00*

U.S. Cl. 455—22 5 Claims



1. In a method for compensating, by means of a distortion converter stage, for a distorted signal component introduced into a high frequency output signal modulated by a useful signal, which component is introduced into the output signal by a transmission member in a radio relay transmission system, the distortion converter stage being provided with first and second mixing diodes, which method includes supplying the converter stage with an intermediate frequency signal modulated by the useful signal and with a local oscillator signal, mixing the modulated intermediate frequency signal and the local oscillator signal by means of the first mixing diode in a manner to produce a first high frequency signal having the same frequency as the output signal, modulated by the useful signal and having a selected power level, mixing the modulated intermediate frequency signal and the local oscillator signal by means of the second mixing diode in a manner to produce a second high frequency signal having the same frequency as the output signal, modulated by the useful signal, having a power level lower than the selected power level, and shifted in phase relative to the first high frequency signal, and combining the first and second high frequency signals in a manner to produce the high frequency output signal such that the output signal has a distorted component whose amplitude coincides with the amplitude of the distorted signal component introduced by the transmission member but whose phase is in phase opposition with the latter, the improvement wherein said steps of mixing are carried out by means of at least two converters each including a respective one of said mixing diodes, said method further comprises supplying the converter containing said second diode with the local oscillator signal via a level and phase controller, and said step of combining is performed in a summing member.

4,346,480

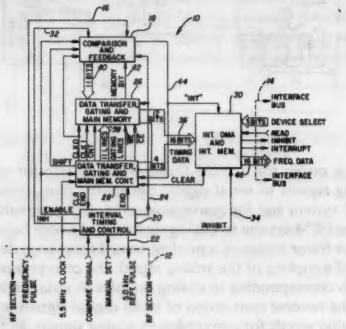
FREQUENCY IDENTIFICATION CIRCUIT

Billy R. Poston, St. Petersburg; Ramon P. Chambers, Clearwater, and Robert S. Gordy, Largo, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 910,943, Apr. 13, 1978, abandoned. This application May 5, 1980, Ser. No. 153,551

Int. Cl.³ H04B *1/16;* H03K *5/22;* G01R *23/16*

U.S. Cl. 455—154 24 Claims



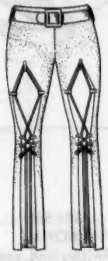
1. A frequency identification circuit for identifying the presence of a frequency in a band of frequencies, comprising:

means for storing at address locations individual frequency information data for the band of frequencies and for generating a memory bit identifying the address location of each of the individual frequencies,

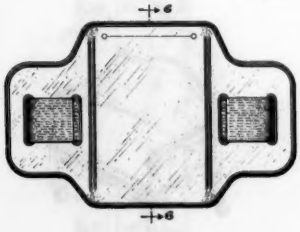
means for comparing a memory bit for an identified individual frequency with a frequency information bit representing the presence of a frequency in the band of frequencies and for generating an indication signal when a comparison occurs thereby indicating the presence of a frequency at the memory bit address in the means for storing, and

encoding means connected to said means for storing and responsive to the indication signal to receive from the means for storing the frequency information data at the address location identified by the memory bit compared with the frequency information bit for encoding into a digital representation of the identified frequency.

265,860
SLACKS
Aziza Smith, 2129 E. 12th, Denver, Colo. 80206
Filed May 30, 1980, Ser. No. 154,801
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

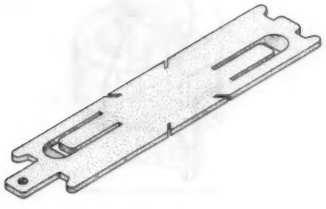


265,861
ARMBAND IDENTIFICATION PASSHOLDER WITH A TRANSPARENT FRONT FACE
Stanley Walasek, 1116 Colonial Way, Bridgewater, N.J. 08807
Filed Mar. 31, 1980, Ser. No. 135,630
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—402



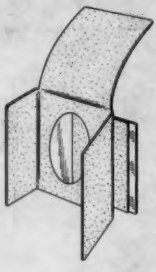
265,862
POLE-MOUNTED SUN SHADE
John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108
Filed May 16, 1980, Ser. No. 150,347
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D3—5

265,863
SEWING THREAD ORGANIZER
Ellen D. McCarn, Birmingham, Ala., assignor to McCarn Enterprises, Inc., Birmingham, Ala.
Filed Jul. 14, 1980, Ser. No. 168,706
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—23

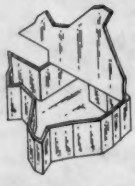


265,864
TOTE BAG WITH ATTACHED POUCH
Donald R. Kracke, 704 Silver Spur Rd., Rolling Hills Estates, Calif. 90274
Filed Aug. 11, 1980, Ser. No. 177,171
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—43

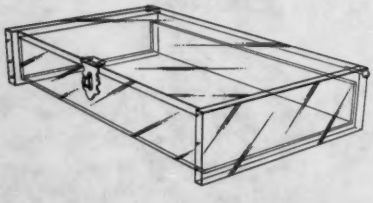
265,865
FOLDABLE PACKET FOR STORING AND DISPLAYING A JEWELRY ARTICLE
James R. Stephens, New York, N.Y., and Margaret Grieve, Towaco, N.J., assignors to General Mills Products Corp., Minneapolis, Minn.
Filed Dec. 27, 1979, Ser. No. 107,687
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—56



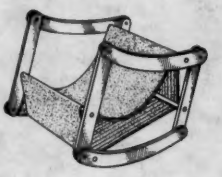
265,866
JEWELRY BOX
Gary M. Levin, 940 E. 19 St., Brooklyn, N.Y. 11230
Filed Aug. 6, 1979, Ser. No. 63,953
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—66



265,867
TRANSPARENT LOCK BOX
Craig S. Margulis, Los Angeles, Calif., assignor to Acrylic Creations, Inc., Van Nuys, Calif.
Filed Mar. 14, 1980, Ser. No. 130,287
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—78



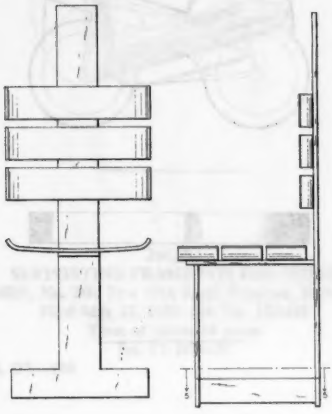
265,868
CONVERTIBLE ROCKING CHAIR
Johannes P. Holschneider, 144 Folger St., Clemson, S.C. 29631
Filed Aug. 28, 1978, Ser. No. 937,206
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—3



265,869
SOFA
Ernst Lüthy, Klingnau, Switzerland, assignor to C & D Consulting & Design AG, Engelberg, Switzerland
Filed Jul. 9, 1980, Ser. No. 167,094
Claims priority, application Hague, Jan. 11, 1980, 69793
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

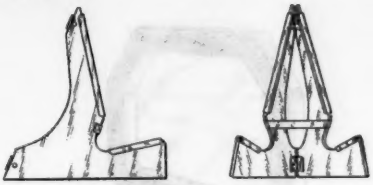
265,870
CHAIR
Daniel D. Wistehuff, Hickory, N.C., assignor to Pinnacle Furniture Company, Inc., Claremont, N.C.
Filed Apr. 18, 1980, Ser. No. 141,400
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

265,871
CHAIR
Steven D. Gageby, 2025 N. Bradley St., St. Paul, Minn. 55117
Filed Jul. 19, 1979, Ser. No. 58,937
The portion of the term of this patent subsequent to May 4, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

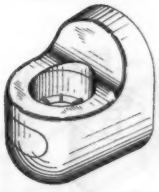


265,872
APPAREL DISPLAY RACK
John A. Rekow, 6130 SW. Taylors Ferry Rd., Portland, Oreg. 97219
Filed Jan. 4, 1980, Ser. No. 109,646
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85

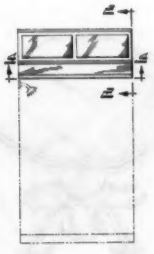
265,873
GUITAR STAND
Larry C. Smith, 22916 Juniper Ave., Torrance, Calif. 90505
Filed Apr. 14, 1980, Ser. No. 140,220
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85



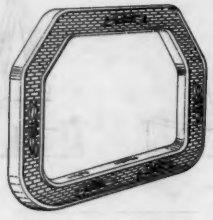
265,874
SUPPORT FOR A HAND-HELD SHOWERHEAD
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Aug. 27, 1979, Ser. No. 70,100
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, MR 6936
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86



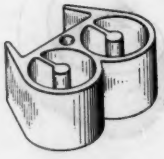
265,875
SHOWER OR TUB STORAGE CABINET
Gregory Wolf, West Reading; Scott Sandman, Fleetwood, and Clark Pearson, Birdsboro, all of Pa., assignors to The Tappan Company, Mansfield, Ohio
Filed Oct. 5, 1979, Ser. No. 82,121
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—86



265,876
TOWEL RACK
Reg Littlefield, Toronto, Canada, assignor to Aqualine Products Limited, Mississauga, Canada
Filed Jul. 17, 1981, Ser. No. 284,173
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—101

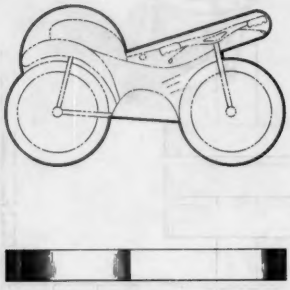


265,877
DRUMSTICK HOLDER
Bruce N. Hardy, Elkhart, Ind., assignor to Silver Street, Incorporated, Elkhart, Ind.
Filed Jun. 23, 1980, Ser. No. 162,017
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—125



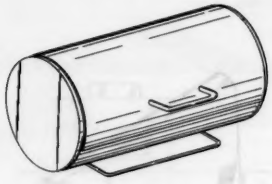
265,878
TABLE
Daniel D. Wistehuff, Hickory, N.C., assignor to Pinnacle Furniture Company, Inc., Claremont, N.C.
Filed Apr. 18, 1980, Ser. No. 141,683
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

265,879
CAKE BAKING FRAME
Helen Bisso, Fairview Heights, Ill., assignor to Paul Bisso, Fairview Heights, Ill.
Filed May 5, 1980, Ser. No. 146,233
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—43

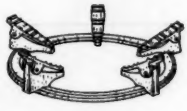


265,880
BEVERAGE CAN HOLDER
Thomas M. Craig, 8200 Lenore St., Houston, Tex. 77017
Filed Aug. 20, 1980, Ser. No. 180,061
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—70

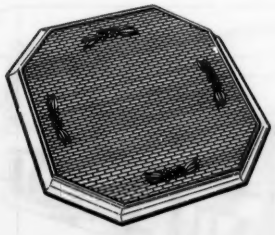
265,881
BARBECUE
Ronald Bell, and Jorn Sorensen, both of Richmond, Canada, assignors to Force 10 Marine Ltd., Richmond, Canada
Filed Jul. 14, 1980, Ser. No. 168,919
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



265,882
SUPPORTING FRAME FOR GAS STOVE
Wen-I Shih, No. 266, Tz'u Wen Road, Taoyuan, Taiwan
Filed May 22, 1980, Ser. No. 152,415
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—130

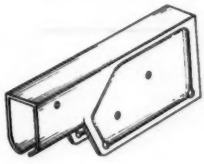


265,883
WALL PLATE
Reg Littlefield, Toronto, Canada, assignor to Aqualine Products Limited, Mississaug, Canada
Filed Jul. 17, 1981, Ser. No. 284,246
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351

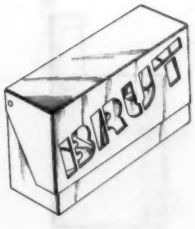


265,884
VIBRATION DAMPENING BRACKET FOR A TAKE-UP CRADLE OF A YARN TEXTURING MACHINE
James B. Mabry, Elon College, N.C., assignor to Mabry Industries, Inc., Elon College, N.C.
Filed Apr. 19, 1979, Ser. No. 31,607
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

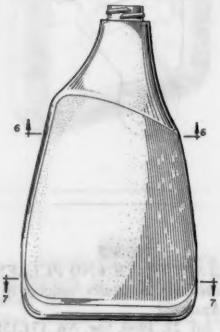
265,885
CURTAIN TRACK END PULLEY
Ivan A. Smith, Cheltenham, Australia, assignor to Village Nominees Pty. Ltd., Australia
Filed Jul. 22, 1980, Ser. No. 171,155
Claims priority, application Australia, Mar. 13, 1980, 80,452
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—358



265,886
BOX
Louise Caputo, New York, N.Y., assignor to Faberge, Incorporated, New York, N.Y.
Filed Nov. 21, 1979, Ser. No. 96,372
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—332



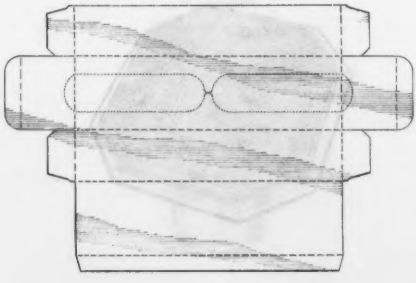
265,887
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to The Clorox Company, Oakland, Calif.
Filed May 27, 1980, Ser. No. 153,833
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375



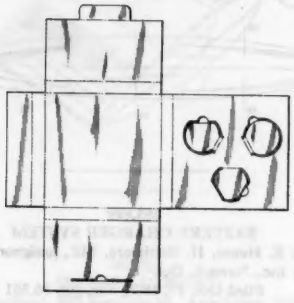
265,888
OIL CONTAINER OR THE LIKE
Charles N. Epperson, Rte. 1, Box 101, Okmulgee, Okla. 74447
Filed Jun. 9, 1980, Ser. No. 181,600
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375

265,889
BRASSIERE DISPLAY PACKAGE
James L. Lawrence, Winston-Salem, N.C., and Joel Heller, Greenlawn, N.Y., assignors to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jan. 28, 1980, Ser. No. 115,913
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—418

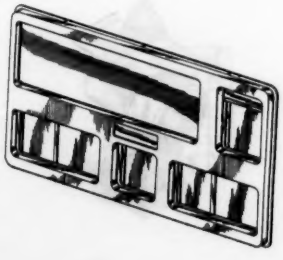
265,890
CARTON BLANK
Floyd F. Fallen, and Calvin L. Wilson, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Nov. 16, 1979, Ser. No. 95,527
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



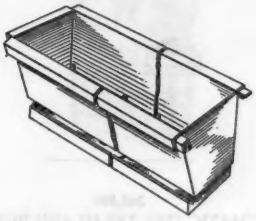
265,891
CARTON BLANK
Michael F. Sammons, 2608 Inwood Rd., Suite 130, Dallas, Tex. 75235
Filed Aug. 4, 1980, Ser. No. 174,832
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



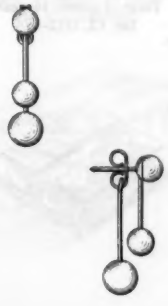
265,892
SPORTS SCOREBOARD
James L. Gebhardt, Roswell, and Ferris L. Hutchins, Jr., Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Aug. 6, 1979, Ser. No. 63,798
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—46.1



265,893
COMBINED MODULAR FLOWER BOX AND TRAY THEREFOR
Donald H. Whiting, 1330 Mississauga Valley Blvd., Unit 26, Mississauga, Ontario, Canada (L5A 3T1)
Filed Apr. 1, 1981, Ser. No. 249,927
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—156

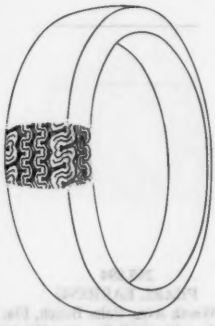


265,894
PEARL EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 26, 1980, Ser. No. 191,441
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—43

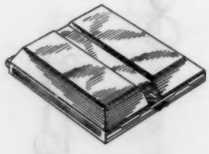


265,895
EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Aug. 7, 1980, Ser. No. 176,122
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—76

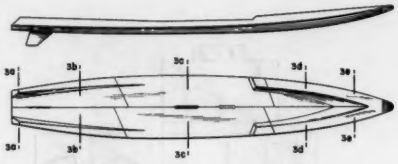
265,896
PNEUMATIC TIRE TREAD AND BUTTRESS
John A. Hutz, Mt. Clemens, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Aug. 18, 1980, Ser. No. 179,361
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



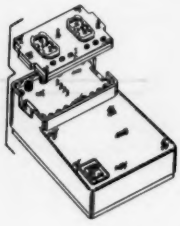
265,897
CAR TOP SKI CARRIER
Gary A. Gerber, 15 White Birch Ridge, Weston, Conn. 06883
Filed Aug. 13, 1979, Ser. No. 65,834
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



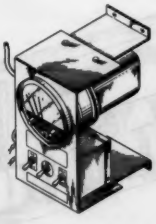
265,898
BOARD FOR WATER SPORTS
Andrej Cerkovnik, Spodnji Rudnik 4/17, and Stane Zvanut, Vrhovci c. XVII/22, both of 61000 Ljubljana, Yugoslavia
Filed Apr. 2, 1980, Ser. No. 136,738
Claims priority, application Yugoslavia, Oct. 3, 1979, M-267/79
Term of patent 14 years
Int. Cl. D12—*06;* D21—*02*
U.S. Cl. D12—303



265,899
BATTERY CHARGER SYSTEM
Lawrence E. House, II, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Oct. 17, 1979, Ser. No. 86,361
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—5



265,900
STATIC PRESSURE CONTROL ASSEMBLY FOR ENVIRONMENTALLY CONTROLLED BUILDINGS AND THE LIKE
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed May 27, 1980, Ser. No. 153,729
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



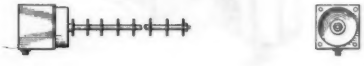
265,901
PORTABLE CASSETTE TAPE RECORDER
Kunishige Miki, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 10, 1980, Ser. No. 158,046
Claims priority, application Japan, Dec. 26, 1979, 54-56153
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

265,902
SPEAKER CABINET
Steven J. Eberbach, 950 Fountain St., Ann Arbor, Mich. 48103
Filed Mar. 7, 1980, Ser. No. 128,467
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

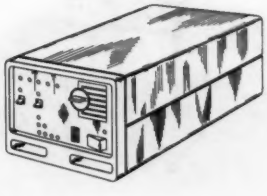
265,903
TELEPHONE
Erwin R. Wendorff, 1 Walnut Hollow La., Lincroft, N.J. 07738
Filed Apr. 16, 1980, Ser. No. 141,132
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

265,904
RADIO RECEIVER
Dieudonne G. Aoijs, Hong Kong, Hong Kong, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 1, 1980, Ser. No. 164,995
Claims priority, application United Kingdom, Jan. 3, 1980, 993033
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

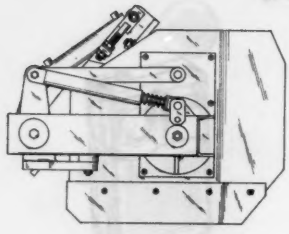
265,905
MICROWAVE ANTENNA
Richard D. Bogner, 4 Hunters La., Roslyn, N.Y. 11576, and Leonard H. King, 67 Southgate Rd., Valley Stream, N.Y. 11581
Filed Mar. 12, 1980, Ser. No. 129,759
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86



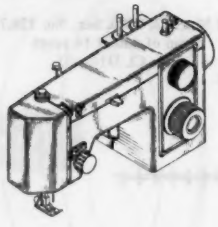
265,906
MODEM
Robert E. Steinbugler, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Jun. 4, 1979, Ser. No. 45,701
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—107



265,907
SNOW PLOW SNOW RETAINING GATE
Gustaf Karlsson, Linkoping, Sweden, assignor to GK Haninge Maskiner AB, Linkoping, Sweden
Filed May 29, 1980, Ser. No. 154,438
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D15—12

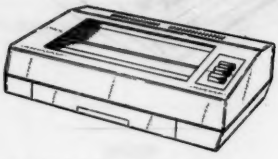


265,908
SEWING MACHINE BRACKET ARM
Eric A. Schneider, Linden, N.J., assignor to The Singer Company, Stamford, Conn.
Filed Apr. 28, 1980, Ser. No. 144,005
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—76



265,909
PAPER SHREDDER OR THE LIKE
Takefumi Hatanaka, Matsudo, Japan, assignor to Lifewell Corporation, Tokyo, Japan
Filed May 19, 1980, Ser. No. 151,493
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D15—127

265,910
PAPER SHREDDER OR THE LIKE
Takefumi Hatanaka, Matsudo, Japan, assignor to Lifewell Corporation, Tokyo, Japan
Filed Jul. 22, 1980, Ser. No. 170,441
Claims priority, application Japan, Apr. 18, 1980, 55-15053
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D15—127



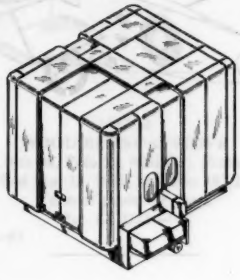
265,911
PAPER SHREDDER OR THE LIKE
Takefumi Hatanaka, Matsudo, Japan, assignor to Lifewell Corporation, Tokyo, Japan
Filed Jul. 22, 1980, Ser. No. 170,442
Claims priority, application Japan, Apr. 18, 1980, 55-015054
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D15—127

265,912

MACHINE TOOL ENCLOSURE

Juergen Frenkel, Berlin, German Democratic Rep., assignor to Veb Werkzeugmaschinenkombinat "7 Oktober", Berlin, German Democratic Rep.

Filed May 14, 1979, Ser. No. 38,722
Claims priority, application German Democratic Rep., Nov. 13, 1978, 13214/M1373
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—138



265,913

DESK TOP ELECTRONIC CALCULATOR

Eiichi Yoshioka, Tokyo, and Hideo Fushimoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

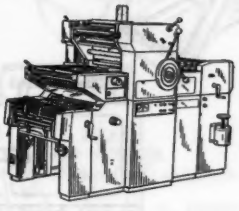
Filed Dec. 12, 1979, Ser. No. 102,838
Claims priority, application Japan, Jun. 14, 1979, 54-24607
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

265,914

PRINTING MACHINE

Etsuo Hiraishi, Hiroshima, and Masakazu Sakamoto, Fukuyama, both of Japan, assignors to Ryobi Limited, Hiroshima, Japan

Filed Nov. 19, 1980, Ser. No. 208,413
Claims priority, application Japan, May 23, 1980, 55-20688
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13

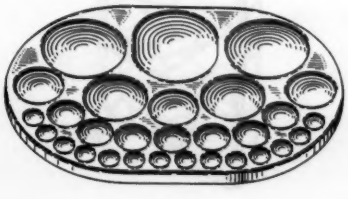


265,915

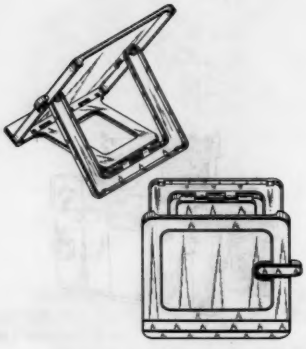
WATERCOLOR PALETTE

Mary Tivey, 18700 NW. Idaho, Portland, Oreg. 97229

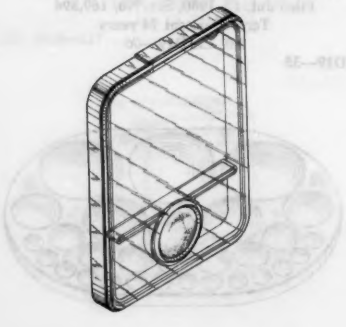
Filed Jul. 17, 1980, Ser. No. 169,894
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



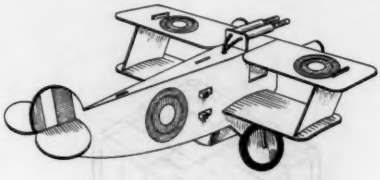
265,916
FOLDABLE STENOGRAPHIC NOTEBOOK HOLDER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed May 9, 1980, Ser. No. 148,524
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



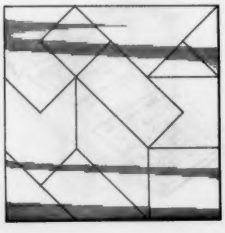
265,917
HOUSING FOR AMUSEMENT WATER TOY
Masahiko Hamaguchi, and Yasuhiro Sato, both of Tokyo, Japan, assignors to Tomy Kogyo Company, Inc., Tokyo, Japan
Filed Sep. 25, 1980, Ser. No. 190,559
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59



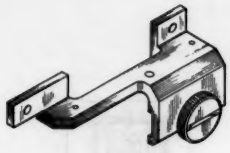
265,918
TOY AIRPLANE
Robert R. Schoch, 517 Otteray Dr., High Point, N.C. 27260
Filed Jun. 26, 1978, Ser. No. 919,392
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89



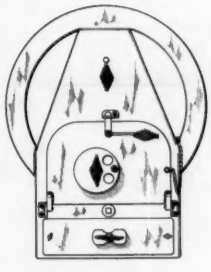
265,919
SQUARE PUZZLE
Klaus W. Spiecker, Notre-Dame des Bois, Comte Frontenac, Quebec, Canada
Filed Dec. 23, 1977, Ser. No. 864,154
Claims priority, application Canada, Jun. 28, 1977, 2806772
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104



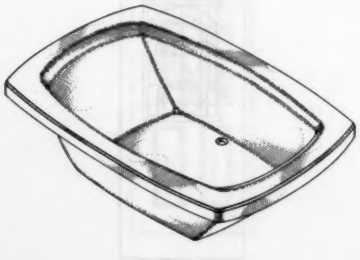
265,920
BASE FOR A RIFLE TELESCOPE MOUNT
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Aug. 18, 1980, Ser. No. 178,730
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



265,921
WOOD BURNING STOVE
Peter Kilham, Box 98, Pole 27, Mill Rd., Foster, R.I. 02825
Filed Sep. 15, 1980, Ser. No. 187,218
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



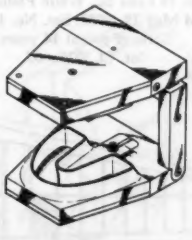
265,922
BATHTUB
Stephen J. Jasperson, Valencia, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Sep. 12, 1980, Ser. No. 186,688
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



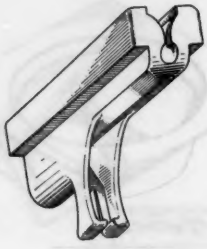
265,923
BATHTUB
Richard J. Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Mar. 31, 1981, Ser. No. 249,375
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

265,924
AIR IONIZER
Stephen J. S. Gehlke, Berkeley, Calif., assignor to Ion Systems, Inc., Berkeley, Calif.
Filed Mar. 6, 1980, Ser. No. 127,897
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

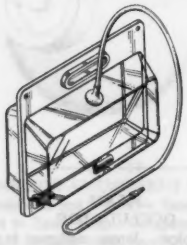
265,925
OCCLUDATOR
Fumio Yogosawa, Tokyo, Japan, assignor to Sankin Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Nov. 8, 1979, Ser. No. 92,261
Claims priority, application Japan, May 11, 1979, 54-19045; May 11, 1979, 54-57839
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—16



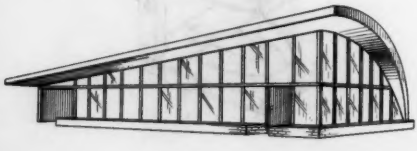
265,926
GRIPPABLE TUBING CLAMP OR THE LIKE
Herbert F. D'Alo, Crystal Lake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Dec. 21, 1979, Ser. No. 106,113
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



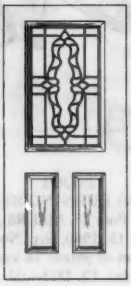
265,927
URINE COLLECTION DEVICE OR THE LIKE
Charles A. Lahay, Fayette, Ala., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 19, 1980, Ser. No. 131,600
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—59



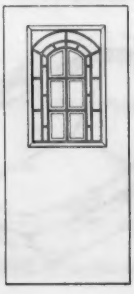
265,928
BUILDING STRUCTURE
Walter F. Feuchs, 16 Lake St., White Plains, N.Y. 10603
Filed May 19, 1980, Ser. No. 150,996
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—18



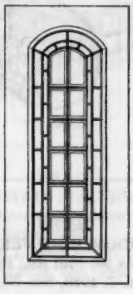
265,929
DOOR
Linda S. Simpson, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.
Filed Mar. 18, 1980, Ser. No. 131,333
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



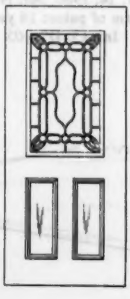
265,930
DOOR
Linda S. Simpson, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.
Filed Mar. 18, 1980, Ser. No. 131,304
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



265,931
DOOR
Linda S. Simpson, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.
Filed Mar. 18, 1980, Ser. No. 131,332
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

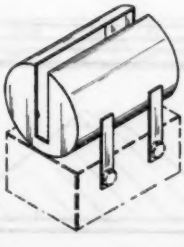


265,932
DOOR
Linda S. Simpson, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.
Filed Mar. 18, 1980, Ser. No. 131,335
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



265,933
DOOR
Linda S. Simpson, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.
Filed Aug. 22, 1980, Ser. No. 163,856
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

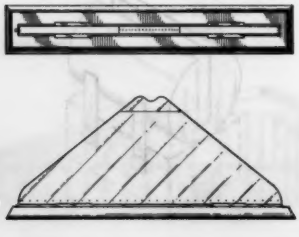
265,934
QUARTZ HALIDE LAMP REFLECTOR-HEAT CONCENTRATOR
Russell R. Ellersick, 7925 Twin Oaks Dr., Citrus Heights, Calif. 95610
Filed Aug. 17, 1978, Ser. No. 934,637
Term of patent 14 years
Int. Cl. D26—*05*; D23—*03*
U.S. Cl. D26—118



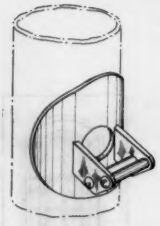
265,935
PIPE
Robert B. Sher, 609 Lochmor, Danville, Calif. 94526
Filed Mar. 31, 1981, Ser. No. 249,624
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

265,936
PIPE
Robert B. Sher, 609 Lochmor, Danville, Calif. 94526
Filed Mar. 31, 1981, Ser. No. 249,626
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

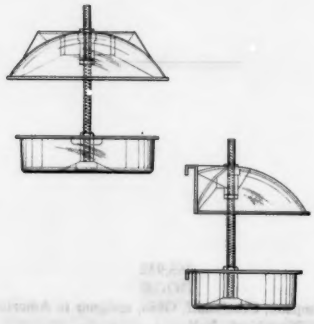
265,937
ANTFARM
Joseph W. Berteloot, 310 Ladera, San Jose, Calif. 95134
Filed May 30, 1980, Ser. No. 154,823
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



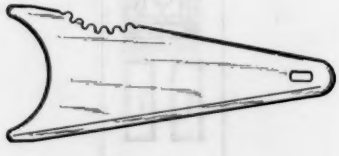
265,938
BIRD FEEDER PERCH
Peter Kilham, P.O. Box 98, Mill Rd., Foster, R.I. 02825
Filed Jun. 2, 1980, Ser. No. 156,312
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



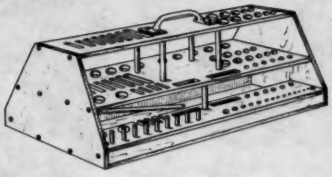
265,939
WINDOW BIRD FEEDER
Peter Kilham, P.O. Box 98, Mill Rd., Foster, R.I. 02825
Filed Jun. 2, 1980, Ser. No. 156,311
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



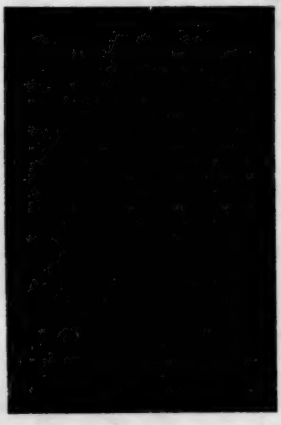
265,940
PAINT ROLLER CLEANER
Sven O. Olsson, 7951 Chicago Ave. South, Minneapolis, Minn. 55420
Filed Mar. 14, 1980, Ser. No. 130,545
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—46



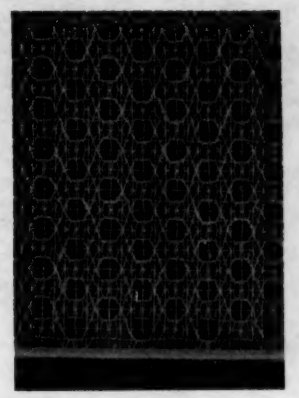
265,941
TOOL CADDY
Monte C. Allison, 1109 Grace Ave., Burlington, N.C. 27215, and Kenneth M. Graves, 295 Cheek La., Graham, N.C. 27253
Filed Jan. 28, 1980, Ser. No. 115,789
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D34—44



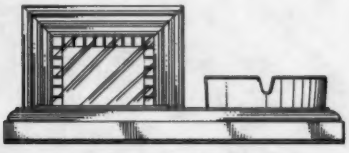
265,942
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed May 1, 1980, Ser. No. 145,669
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1979, URA 1193
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



265,943
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Sep. 9, 1980, Ser. No. 185,616
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, URA 365
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



265,944
COMBINED TOY BANK AND ASH TRAY
Robert F. Word, 115 E. 83rd St. South, Wichita, Kans. 67233
Filed May 27, 1980, Ser. No. 153,530
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—36



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF AUGUST, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Nielsen Company: *See*—
Marshall, Robert, 4,345,753, Cl. 271-146.000.

A. E. Staley Manufacturing Company: *See*—
Orthoefer, Frank T.; and Ogden, Lynn V., 4,346,122, Cl. 426-656.000.

A-T-O Inc.: *See*—
Giorgini, Eugene A.; and Sullivan, John L., 4,345,592, Cl. 128-204.260.
Sullivan, John L., 4,345,593, Cl. 128-204.260.

Aamodt, Norman O. Oil filter wrench. 4,345,494, Cl. 81-64.000.

Aarseth, Harald. Universal tank and ship support arrangement. 4,345,861, Cl. 410-68.000.

AB Svenska Flaktfabriken: *See*—
Gustavsson, Lennart; and Maatta, Osten, 4,345,921, Cl. 55-223.000.

Abbott Laboratories: *See*—
Braber, Robert J., 4,345,963, Cl. 156-423.000.

Abe, Hideshi; and Tonooka, Koji, to Mitsui Kensetsu Kabushiki Kaisha. Process for preventing blockage in distillation column of treatment apparatus for ammoniacal waste liquid. 4,345,975, Cl. 203-37.000.

Abe, Shinya: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.

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Noall, Kenneth L., 4,345,669, Cl. 187-10.000.

Acco Industries Inc.: *See*—
Greene, Larry D., 4,345,866, Cl. 414-224.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,346,025, Cl. 524-141.000.

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Maurer, Alexander; Adrian, Renate; and Heymer, Gero, 4,346,065, Cl. 423-305.000.

AEG-Elotherm, G.m.b.H.: *See*—
Matthes, Hans; and Reifenrath, Klaus, 4,346,423, Cl. 361-87.000.

Agency of Industrial Science & Technology: *See*—
Fukasawa, Akira; and Ueda, Minoru, 4,345,987, Cl. 204-290.00R.

AGFA-Gevaert Aktiengesellschaft: *See*—
Stemme, Otto; Lermann, Peter; and Cocron, Istvan, 4,345,827, Cl. 354-25.000.

Agrifurane S.A.: *See*—
Delmas, Michel; Gaset, Antoine; and Le Bigot, Yves, 4,346,040, Cl. 549-505.000.

Agway, Inc.: *See*—
Braund, Darwin G.; Fronk, Thomas J.; Goings, Richard L.; Peters, John W.; and Steele, Robert L., 4,346,077, Cl. 424-156.000.

Aharon, Naaman B. System for the utilization of solar energy. 4,345,582, Cl. 126-424.000.

Ahrendt, James H. Magnetic separator. 4,345,995, Cl. 209-219.000.

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Dalton, Augustine I., Jr.; and Sircar, Shivaji, 4,346,019, Cl. 252-416.000.

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Terrell, Ross C.; and Hansen, Kirsten, 4,346,246, Cl. 568-684.000.

Aisin Seiki Company, Ltd.: *See*—
Ohomi, Atsushi, 4,345,506, Cl. 91-376.00R.

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Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,345,771, Cl. 277-205.000.

Ajinomoto Company, Incorporated: *See*—
Akashi, Kunihiko; Nakamura, Yayoi; Tsuchida, Takayasu; Yoshii, Hiroe; and Ikeda, Shigeho, 4,346,169, Cl. 435-114.000.
Sano, Kounosuke; and Tsuchida, Takayasu, 4,346,170, Cl. 435-115.000.

Akashi, Kunihiko; Nakamura, Yayoi; Tsuchida, Takayasu; Yoshii, Hiroe; and Ikeda, Shigeho, to Ajinomoto Company, Incorporated. Method for production of L-arginine by fermentation. 4,346,169, Cl. 435-114.000.

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Akkerman, Neil H.; and Vazquez, Gonzalo, to Baker International Corporation. Apparatus and method for the mechanical sequential release of cementing plugs. 4,345,651, Cl. 166-291.000.

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Akzona Incorporated: *See*—
Davis, Michael A.; and Spivey, Bron W., 4,345,424, Cl. 57-209.000.
Hof, Craig R.; Ulin, Roy A., Jr.; and Polak, Robert B., 4,345,470, Cl. 374-106.000.
Zengel, Hans G.; Bergfeld, Manfred F.; and Zielke, Rainer, 4,346,233, Cl. 562-439.000.

Albaugh, Neil P.; and Stitt, Robert M., to Burr-Brown Research Corp. Low profile optical coupling to planar-mounted optoelectronic device. 4,346,294, Cl. 250-227.000.

Albert Obrist AG: *See*—
Obrist, Albert; and Breuer, Hans, 4,345,692, Cl. 215-252.000.

Alcan Research and Development Limited: *See*—
Sivilotti, Olivo G.; Sulzer, John; and Treganza, Alan F., 4,345,743, Cl. 266-44.000.

Alegre, Adolfo P.; Guidote, Armando E.; and Puyat, Alfonso G. Multi-fuel vapor charger carburetion system and device therefor. 4,345,568, Cl. 123-522.000.

Alewelt, Wolfgang; Margotte, Dieter; Wulff, Claus; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Process for the preparation of polycarbonates catalyzed by cyclic aza compounds. 4,346,210, Cl. 528-199.000.

Alexander, John A.: *See*—
Lindman, William E.; and Alexander, John A., 4,345,996, Cl. 210-96.100.

Alexander, Willis R.; and Shaltis, Robert J., to Hastings Manufacturing Co.; and Mack Trucks. Centrifugal spin-on filter or separator. 4,346,009, Cl. 210-512.100.

Alexis, Roger P. J., to U.S. Philips Corporation. Data transmission system operating on the spread spectrum principle. 4,346,475, Cl. 375-1.000.

Alfa Romeo S.p.A.: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,346,443, Cl. 364-431.040.

Allaire, Roger A.; and VanDewoestine, Robert V., to Corning Glass Works. Wood burning stove. 4,345,528, Cl. 110-203.000.

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Allen, Charles A.; and Houston, David T., to Texas Instruments Incorporated. Solid state recorder. 4,346,390, Cl. 346-76.0PH.

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Allen, Reed R., deceased; and Allen, Mary G., heir, 4,345,440, Cl. 62-116.000.

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Allen, Richard A. Carrying bag, particularly for bicycles. 4,345,703, Cl. 224-32.00A.

Allied Corporation: *See*—
Carlson, Charles E., 4,345,467, Cl. 73-309.000.
Grey, Roger A.; and Pez, Guido P., 4,346,240, Cl. 568-842.000.

Alonso, Sydney A.; and Jones, Cameron W., to New England Digital Corp. High resolution musical note oscillator and instrument that includes the note oscillator. 4,345,500, Cl. 84-1.010.

Alsthom-Atlantique: *See*—
Blanc, Jacques; Coulon, Andre; and Pellus, Gilbert, 4,345,977, Cl. 204-26.000.

Alt, Gerhard H., to Monsanto Company. Herbicidal 2-haloacetanilides. 4,345,938, Cl. 71-118.000.

Altman, Josef; and Roth, Zdenek, to Skoda, oborovy podnik. Arrangement for the regulation of the height of a liquid level. 4,345,618, Cl. 137-393.000.

Alvarez, Joseph A., III; and Shabe, John, to International Business Machines Corporation. Initial acquisition of synchronization for a station in a TDMA satellite communication network. 4,346,470, Cl. 370-104.000.

Alwani, Dru W.: *See*—
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,346,190, Cl. 524-522.000.

Ambasz, Emilio; and Piretti, Giancarlo, to Center for Design Research and Development N.V. Mounting device for a chair seat. 4,345,733, Cl. 248-561.000.

American Cyanamid Company: *See*—
Pfeiffer, Ronald E., 4,346,053, Cl. 264-561.000.
Spatz, David M., 4,346,242, Cl. 568-586.000.

American Optical Corporation: *See*—
Siegmund, Walter P., 4,345,833, Cl. 355-1.000.
AMF Incorporated: *See*—
Brown, Robert L., 4,345,454, Cl. 73-1.00E.
Sorensen, Egon, 4,345,802, Cl. 312-42.000.
AMP Incorporated: *See*—
Bakermans, Johannes C. W., 4,345,810, Cl. 339-75.0MP.
Sizemore, Ronald D.; Tucci, John J.; and Willette, Albert D., 4,345,889, Cl. 425-122.000.
Ampex Corporation: *See*—
Chase, James P., 4,345,367, Cl. 29-603.000.
Amstutz, Jean-Pierre, to Bucher Guyer A.G. Maschinenfabrik. Haygathering machine for pulling windrows, turning and scattering hay. 4,345,422, Cl. 56-370.000.
Anaconda Company, The: *See*—
Lindell, Willard G., 4,345,724, Cl. 242-115.000.
Anagnostidis, Marc: *See*—
Coupry, Jean; and Anagnostidis, Marc, 4,345,951, Cl. 148-2.000.
Anderson, Carl M.; and Losey, Vernon L., to Hesston Corporation. Quick attach loader. 4,345,870, Cl. 414-686.000.
Anderson Jacobsen, Inc.: *See*—
Doty, Jay, 4,346,259, Cl. 178-3.000.
Andersson, Uno K. T. Spring type apparatus for projecting balls. 4,345,577, Cl. 124-16.000.
Andros Analyzers Incorporated: *See*—
Passaro, Robert E.; and Williams, Kevin, 4,346,296, Cl. 250-343.000.
ANIC, S.p.A.: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Brunelli, Maurizio, 4,346,188, Cl. 524-104.000.
Anno, Nobuo; Okui, Haruki; Yamamoto, Kuniyuki; and Miyazaki, Kunio, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission for two-wheeled vehicle. 4,345,664, Cl. 180-230.000.
Ansaldo Societa per Azioni: *See*—
Colmano, Riccardo, 4,345,549, Cl. 122-34.000.
Apollo Systems, Inc.: *See*—
Speer, Richard A., 4,345,578, Cl. 124-56.000.
Arabadji, Petre, to Institutul de Cercetari Pentru Industria Electrotehnica. Method and apparatus for generating high current impulses. 4,346,306, Cl. 307-108.000.
Araki, Sadaakira: *See*—
Suzuki, Nagatoshi; Araki, Sadaakira; and Kawazoe, Soichi, 4,345,572, Cl. 123-568.000.
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, to Matsushita Electric Industrial Co., Ltd. Juice extractor. 4,345,517, Cl. 99-511.000.
Araoka, Katsumasa: *See*—
Nakaya, Shunichi; and Araoka, Katsumasa, 4,345,926, Cl. 62-38.000.
Aratame, Kazuhisa, to Konishiroku Photo Industry Co., Ltd. Motor driven type camera. 4,345,830, Cl. 354-173.000.
Arbed S.A.: *See*—
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; Lorang, Lucien; and Baumert, Jean, 4,345,746, Cl. 266-90.000.
Aristo Graphic Systeme GmbH & Co.: *See*—
Kaufmann, Rainer, 4,346,260, Cl. 178-18.000.
Aristoff, Paul A., to Upjohn Company, The. Composition and process. 4,346,041, Cl. 549-498.000.
Arizpe, Ramiro. Disposable bag mounting and shutdown mechanism for rotary lawn mower. 4,345,418, Cl. 56-202.000.
Armstrong, John C.; and O'Neil, Joseph H., to Pharmasol Corporation, The. Sachet. 4,345,716, Cl. 239-56.000.
Armstrong World Industries, Inc.: *See*—
Garrett, Thomas B.; Herweh, John E.; Magnusson, Alan B.; and Miller, Normal L., 4,346,186, Cl. 524-82.000.
Arnheiter, Adolf; and Enzler, Rudolf, to Arnheiter AG, Forta-Seilwerke. Fibrous reinforcing means for cementitiously and bituminously bound composite structures and coatings. 4,346,135, Cl. 428-212.000.
Arnheiter AG, Forta-Seilwerke: *See*—
Arnheiter, Adolf; and Enzler, Rudolf, 4,346,135, Cl. 428-212.000.
Arnold, Carroll H., to Wain-Roy, Inc. Connectors. 4,345,872, Cl. 414-705.000.
Arnold, William T., to Browwer Turf Equipment Limited. Automatic steering mechanism for sod processing machine and shoe therefor. 4,345,659, Cl. 180-131.000.
Aronson, David L.; Tabor, Edward; and Gerety, Robert J., to United States of America, Health and Human Services. Hepatitis B immune globulin used to inactivate hepatitis B virus in injectable biological products. 4,346,073, Cl. 424-86.000.
ASA S.A.: *See*—
Derail, Yves, 4,345,721, Cl. 242-18.100.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Tachihara, Satoru, 4,345,821, Cl. 350-427.000.
Tachihara, Satoru, 4,345,822, Cl. 350-427.000.
Asai, Hajime; Tada, Hisashi; and Gomi, Takeo, to Mitsubishi Rayon Company, Limited. Process for producing thermosetting resin film. 4,345,959, Cl. 156-244.110.
ASEA Aktiebolag: *See*—
Adolfsson, Morgan; and Brogardh, Torgny, 4,345,482, Cl. 73-862.590.
Ashland Coal, Inc.: *See*—
Rigsby, Lee S., 4,346,058, Cl. 422-104.000.
Ashton, W. Ronald: *See*—
Morley, Robert G.; and Ashton, W. Ronald, 4,346,120, Cl. 426-565.000.
Asselin, Andre A.: *See*—
Humber, Leslie G.; Bruderlein, Francois T.; and Asselin, Andre A., 4,346,090, Cl. 424-258.000.
Association pour la Recherche et Developpement des Methodes et Processus Industriels (ARMINES): *See*—
Barlier, Pernette; and Torre, Jean-Paul, 4,346,147, Cl. 428-446.000.
Astbury, Brian R.: *See*—
Pamplin, John W.; Astbury, Brian R.; and Shillito, Richard, 4,345,451, Cl. 72-286.000.
Atlantic Richfield Company: *See*—
Doak, Kenneth; Bi, Le-Khac; and Milkovich, Ralph, 4,346,198, Cl. 525-314.000.
Warfel, David R., 4,346,193, Cl. 525-52.000.
Au, Robert W., to Occidental Research Corporation. Chlorination leaching with sulfur extraction for recovery of zinc values. 4,346,062, Cl. 423-109.000.
Aue, Peter; and Huttemann, Werner, to Hewlett-Packard GmbH. Pulse generator circuit. 4,346,311, Cl. 307-268.000.
Austin Company, The: *See*—
Raab, Frederick H., 4,346,384, Cl. 343-112.00R.
Auto-Line Manufacturing Corp.: *See*—
Shekel, Joseph; and DeStefano, Joseph, 4,345,807, Cl. 339-31.00B.
Automotive Products Limited: *See*—
Jarvis, Roger P., 4,345,676, Cl. 192-107.00C.
Ayerst, McKenna & Harrison Ltd.: *See*—
Humber, Leslie G.; Bruderlein, Francois T.; and Asselin, Andre A., 4,346,090, Cl. 424-258.000.
Azimov, Alexandr A.: *See*—
Minasov, Alexandr N.; Suslov, Alexandr N.; Azimov, Alexandr A.; and Marapulets, Gennady N., 4,345,867, Cl. 414-287.000.
B. F. Goodrich Company, The: *See*—
Cohen, Louis, 4,346,202, Cl. 526-83.000.
Park, Hung S.; Ryan, William D., Jr.; and Paine, Harold L., 4,345,949, Cl. 134-22.160.
Baader, Helmut. Multiple pressure switch. 4,346,276, Cl. 200-329.000.
Bach, Hanswilhelm; Brundin, Eike; and Gick, Wilhelm, to Ruhrchemie AG. Process for the preparation of 2-methylene aldehydes. 4,346,239, Cl. 568-461.000.
Badger Meter, Inc.: *See*—
Elkins, C. Edward, 4,346,263, Cl. 179-2.00A.
Baer, Ralph H.; and Cope, Leonard D., to Sanders Associates, Inc. Apparatus for synchronization of a source of computer controlled video to another video source. 4,346,407, Cl. 358-149.000.
Baetke, Robert E., to Tektronix, Inc. Linear and logarithmic sweep control circuits for a voltage-controlled oscillator. 4,346,352, Cl. 331-178.000.
Bagdy, Daniel: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; Bagdy, Daniel; and Mohai nee Nagy, Zsuzsanna, 4,346,078, Cl. 424-177.000.
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, to United States of America, Agriculture. Antimicrobial glycolic acid derivatives. 4,346,043, Cl. 260-404.000.
Baines, Eric; and Carr, John F., to Colgate-Palmolive Company. Dentifrices. 4,346,072, Cl. 424-49.000.
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; Bagdy, Daniel; and Mohai nee Nagy, Zsuzsanna, to Richter Gedeon Vegyeszeti Gyar Rt. Novel anticoagulant agmatine derivatives and process for the preparation thereof. 4,346,078, Cl. 424-177.000.
Baker International Corporation: *See*—
Akkerman, Neil H.; and Vazquez, Gonzalo, 4,345,651, Cl. 166-291.000.
Baker, Randy S.; and Eckmann, Gerald C., to BJ-Hughes Inc. Packer deflate subassembly for an inflatable packer system. 4,345,653, Cl. 166-317.000.
Bakermans, Frank C.; and Conrad, Lee R., to Du Pont de Nemours, E. I., and Company. Process for manufacturing multilayer ceramic chip carrier modules. 4,345,955, Cl. 156-89.000.
Bakermans, Johannes C. W., to AMP Incorporated. Integrated circuit connector. 4,345,810, Cl. 339-75.0MP.
Balachandran, Chandrasegaram, to Lucas Industries Limited. Fuel supply system. 4,345,567, Cl. 123-510.000.
Balchunas, Charles A., to General Electric Company. Thermostat and iron assembly. 4,345,389, Cl. 38-77.700.
Baldauf, Gunter: *See*—
Ruchser, Erich; Ott, Helmut; and Baldauf, Gunter, 4,345,620, Cl. 137-596.160.
Baldwin-Gregg, Inc.: *See*—
Gregoire, Clyde G., 4,345,906, Cl. 493-432.000.
Baldwin, John J.; and McClure, David E., to Merck & Co., Inc. Preparation of epihalohydrin enantiomers. 4,346,042, Cl. 549-557.000.
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F. Air and moisture barrier for electrical outlet boxes. 4,345,693, Cl. 220-3.300.
Ball, William J.; Palmer, Keith W.; and Stewart, David G., to British Petroleum Company Limited, The. Method for producing aluminosilicates, their use as catalysts and supports and method for producing catalysts therefrom. 4,346,021, Cl. 252-431.00N.
Ballabio, Adriano: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Brunelli, Maurizio, 4,346,188, Cl. 524-104.000.
Ballheimer, Benny, to Caterpillar Tractor Co. Lubrication system for an engine. 4,345,797, Cl. 308-122.000.
Balzer, Winton E.; and Knobel, Kenneth M. Cup lidding apparatus and leakproof cup. 4,345,412, Cl. 53-297.000.

Balzers Aktiengesellschaft: *See*—
Kaufmann, Helmut, 4,346,123, Cl. 427-38.000.

Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., to GAF Corporation. Thickened acrylic polymer latices. 4,346,190, Cl. 524-522.000.

Barabas, Eva: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; Bagdy, Daniel; and Mohai nee Nagy, Zsuzsanna, 4,346,078, Cl. 424-177.000.

Barat, Jean, to Metraflu. Gas flow measuring device. 4,345,478, Cl. 73-861.090.

Barendrecht, Embrecht: *See*—
de Groot, Hans; van den Heuvel, Eeuwoud; Barendrecht, Embrecht; and Janssen, Leonard J. J., 4,345,978, Cl. 204-74.000.

Barlier, Pernette; and Torre, Jean-Paul, to Association pour la Recherche et Developpement des Methodes et Processus Industriels (ARMINES). Method of manufacturing nitrided silicon parts. 4,346,147, Cl. 428-446.000.

Barlow, Gordon A.; Krutsch, John R.; and Karlin, Richard A., to Gordon Barlow Design. Hand-held electronic game. 4,345,764, Cl. 273-313.000.

Barlow, Robert C., to O. A. Newton & Son Company. Particulate material dispensing and weighing system and method. 4,345,858, Cl. 406-34.000.

Barmore, Donald L.: *See*—
Cobleigh, Wendall C.; Barmore, Donald L.; and Geschwender, Robert C., 4,345,497, Cl. 83-105.000.

Barnes, David I.: *See*—
Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., 4,346,212, Cl. 528-229.000.

Baron, Arthur L.: *See*—
Krishnan, Sivaram; and Baron, Arthur L., 4,346,211, Cl. 528-202.000.

Barraco, Stephen: *See*—
Rizzo, Charles P.; Barraco, Stephen; and Quinn, James, 4,345,868, Cl. 414-408.000.

Barten, Piet G. J., to U.S. Philips Corporation. Display tube for displaying color pictures. 4,346,327, Cl. 313-413.000.

Barter, Arthur J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Thrust units. 4,345,729, Cl. 244-169.000.

Bartoli, Filbert J.; and Meyer, Jerry R., to United States of America, Navy. Laser technique for accurately determining the compensation density in N-type narrow gap semiconductor. 4,346,348, Cl. 324-158.00R.

Barton, Ronald S. C., to Molins, Ltd. Paper splicing device, especially for cigarette or filter rod-making machines. 4,345,709, Cl. 226-195.000.

Barton Valve Company: *See*—
Wheatley, Charles, 4,345,739, Cl. 251-358.000.

Bartsch, Wolfgang: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Bartsch, Wolfgang; and Dietmann, Karl, 4,346,093, Cl. 424-269.000.

Bartz, Gerald L., to Phillips Petroleum Company. Uranium prospecting based on selenium and molybdenum. 4,345,912, Cl. 23-230.0EP.

Baschang, Gerhard: *See*—
Sallmann, Alfred; and Baschang, Gerhard, 4,346,104, Cl. 424-309.000.
Sallmann, Alfred; and Baschang, Gerhard, 4,346,105, Cl. 424-309.000.

BASF Aktiengesellschaft: *See*—
Hack, Joachim, 4,346,413, Cl. 360-77.000.
Vescia, Michele; and Heimann, Sigismund, 4,345,910, Cl. 8-610.000.

Basham, Edward R.; and Cmelik, Helmut R. M. Rotary flow meter. 4,345,480, Cl. 73-861.770.

Basola, Carlo P.; and Chiaretti, Guido, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Process and apparatus for spherically curving an end of an optical fiber. 4,345,930, Cl. 65-102.000.

Bassi, Aldo: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,346,443, Cl. 364-431.040.

Bauch, Helmut; and Rehm, Hans, to Siemens Aktiengesellschaft. Broad band coupling arrangement. 4,346,381, Cl. 340-825.930.

Bauer, Werner R.; and Smith, William N., to Robertshaw Controls Company. Control unit and electrical switch construction therefor—methods of making such a control unit and electrical switch construction. 4,345,369, Cl. 29-622.000.

Baugh, John L.; and Montgomery, James W., to Hughes Tool Company. Well packer. 4,345,649, Cl. 166-120.000.

Baumann, Gerhard, to Georg Fischer Aktiengesellschaft. Tool for joining pipes. 4,345,361, Cl. 29-237.000.

Baumann, Hans D. Clamp-on quick disconnect rotary valve linkage arrangement. 4,345,850, Cl. 403-373.000.

Baumann, John S.; Knipp, Roger W.; and Kacin, Joseph J., to Fluxcom, Inc. Magnetic tape de-gausser and method of erasing magnetic recording tape. 4,346,426, Cl. 361-151.000.

Baumert, Jean: *See*—
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; Lorang, Lucien; and Baumert, Jean, 4,345,746, Cl. 266-90.000.

Baxter Travenol Laboratories, Inc.: *See*—
Kopp, Clinton V.; and Shah, Dilip, 4,346,006, Cl. 210-321.400.

Bayer Aktiengesellschaft: *See*—
Alewelt, Wolfgang; Margotte, Dieter; Wulff, Claus; and Vernaleken, Hugo, 4,346,210, Cl. 528-199.000.
Dhein, Rolf; Schoeps, Jochen; and Kuchenmeister, Rolf, 4,346,044, Cl. 260-404.800.
Schmidt, Adolf; Meier, Helmut; Schedrat, Gunther; and Bockmann, August, 4,346,203, Cl. 526-225.000.

Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., to Eli Lilly and Company. 3-Aryl-5-isothiazolecarboxylic acids and related compounds used to lower uric acid levels. 4,346,094, Cl. 424-270.000.

Beckman Instruments, Inc.: *See*—
Gutierrez, William S.; Gropper, Lee; and Brown, Hugh O., 4,345,713, Cl. 233-1.00B.

Bedford, Clifford D.: *See*—
Levins, Donald A.; Bedford, Clifford D.; and Coon, Clifford L., 4,346,222, Cl. 544-322.000.

Beecham Group Limited: *See*—
Cole, Martin; and Edmondson, Robert A., 4,346,168, Cl. 435-43.000.
Hadley, Michael S.; King, Francis D.; and Martin, Roger T., 4,346,089, Cl. 424-248.520.

Behringwerke Aktiengesellschaft: *See*—
Kohl, Helmut, 4,345,911, Cl. 23-230.00B.

Beiersdorf Aktiengesellschaft: *See*—
Sattler, Henning; and Ulex, Georg A., 4,346,086, Cl. 424-243.000.

Bell Telephone Laboratories, Incorporated: *See*—
Blahut, Donald E.; and Ukeiley, Richard L., 4,346,437, Cl. 364-200.000.
Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., 4,346,396, Cl. 357-70.000.
Choi, Jae H.; Mottine, John J., Jr.; Sparzak, Walter J., Sr.; and Vesperman, William C., 4,346,145, Cl. 428-389.000.
Kinsbron, Eliezer; and Vratny, Frederick, 4,346,125, Cl. 427-96.000.
Mallos, James B., 4,346,376, Cl. 340-712.000.
Schiavone, James A.; and Vigants, Arvids, 4,346,385, Cl. 343-703.000.

Bellows, Richard J.; Grimes, Patrick G.; Newby, Kenneth R.; Einstein, Harry; and Tsien, Hsue C., to Exxon Research & Engineering Co. Electrochemical construction. 4,346,150, Cl. 429-18.000.

Belyavsky, Alexandr S.: *See*—
Lezgintsev, Georgy M.; Garbuz, Evgeny I.; Kontar, Evgeny A.; Glukhikh, Rudolf G.; Murdmaa, Ivar O.; Soluyanov, Vadim G.; Belyavsky, Alexandr S.; and Kuznetsov, Alexei N., 4,345,461, Cl. 73-170.00A.

Bender, Hans-Eberhard: *See*—
Hofmann, Heinrich; Markfelder, Gunther; and Bender, Hans-Eberhard, 4,345,800, Cl. 308-217.000.

Bendix Corporation, The: *See*—
Brown, Arthur K., 4,345,773, Cl. 280-6.00R.
Francis, William H.; and Natter, Eckard F., 4,346,386, Cl. 343-765.000.
Ritsema, Irving R., 4,345,675, Cl. 188-73.430.

Bendix Westinghouse Ltd.: *See*—
Neal, Brian P., 4,345,767, Cl. 277-12.000.

Benfer, Neil A., Jr. Tree surgery methods. 4,345,404, Cl. 47-8.000.

Benit, Claude. Luggage-carrier or auxiliary luggage compartment for motor cars. 4,345,706, Cl. 224-327.000.

Bennett, John E.; and Elliott, Joseph E., to Diamond Shamrock Corporation. Anodically polarized surface for biofouling and scale control. 4,345,981, Cl. 204-129.000.

Benson, Albert R.; and Willats, James F., to Reed Manufacturing Company. Cutter for thick wall plastic pipe. 4,345,376, Cl. 30-96.000.

Berchoux, Andre; and Coquet, Andre, to Rhone-Poulenc-Textile. Process and apparatus for cutting a tow and continuously opening the fibers obtained. 4,345,355, Cl. 19-0.600.

Berger, Horst H.; and Wiedmann, Siegfried K., to International Business Machines Corporation. I^2L Monolithically integrated storage arrangement. 4,346,458, Cl. 365-174.000.

Bergfeld, Manfred F.: *See*—
Zengel, Hans G.; Bergfeld, Manfred F.; and Zielke, Rainer, 4,346,233, Cl. 562-439.000.

Berglund, Erling G.; and Krook, Hans J., to Clinicon AB. Agitator. 4,345,843, Cl. 366-219.000.

Bergstrand, Gunnar M. Pipe coupling device. 4,345,783, Cl. 285-12.000.

Bermas Plastics Co., Inc.: *See*—
China, David B., 4,345,761, Cl. 273-146.000.

Berndlmaier, Erich; Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., to International Business Machines Corporation. Power control means for eliminating circuit to circuit delay differences and providing a desired circuit delay. 4,346,343, Cl. 323-282.000.

Bernett, Frank W.: *See*—
Riggle, Charles M.; Read, John D.; Noe, William B.; Winfrey, Richard; Pollard, Christopher A.; and Bernett, Frank W., 4,346,416, Cl. 360-106.000.

Berni, Albert J., to Shell Oil Company. Vertical component accelerometer. 4,345,473, Cl. 73-516.0LM.

Berry, David A.: *See*—
Hillenbrand, Louis J.; Preston, Joseph R.; and Berry, David A., 4,346,469, Cl. 369-276.000.
Preston, Joseph R.; Hillenbrand, Louis J.; and Berry, David A., 4,346,468, Cl. 369-276.000.

Bertoloni, Luciano: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,346,443, Cl. 364-431.040.

Berube, Jean-Noel: *See—*
Buijs, Henry L.; Vail, Garry L.; and Berube, Jean-Noel, 4,345,838, Cl. 356-346.000.
Berzen, Josef; and Mrozik, Herbert, to Ruhrchemie AG. Striking cap lining. 4,345,656, Cl. 173-131.000.
Besecker, Jack J. Apparatus for forming lines on an athletic playing field or court. 4,345,544, Cl. 118-108.000.
Best, Gary R., to Rival Manufacturing Company. Food slicing machine. 4,345,498, Cl. 83-707.000.
Beth GmbH: *See—*
Krull, Walther; Kohn, Dieter; and Schiller, Wolf-Dieter, 4,345,623, Cl. 137-637.200.
Bethlehem Steel Corporation: *See—*
Spengler, Emerson D.; and Schaeffer, Charles W., 4,345,492, Cl. 76-101.00R.
Beyer, John D.: *See—*
Schneider, Samuel; and Beyer, John D., 4,346,444, Cl. 364-475.000.
Bhattacharyya, Sushantha K.; and El-Menshawy, Mohamed F., to National Research Development Corporation. Methods and apparatus for electrical discharge machining. 4,346,278, Cl. 219-69.00M.
Bi, Le-Khac: *See—*
Doak, Kenneth; Bi, Le-Khac; and Milkovich, Ralph, 4,346,198, Cl. 525-314.000.
Bickel, Wolf, to Krautkramer-Branson, Inc. Method and apparatus for receiving ultrasonic energy by optical means. 4,345,475, Cl. 73-657.000.
Billings, William W., to Westinghouse Electric Corp. Solid state status indication circuit for power controllers. 4,346,375, Cl. 340-644.000.
Binz, Jorg: *See—*
Guth, Christian; Gysin, Hanspeter; and Binz, Jorg, 4,345,909, Cl. 8-477.000.
Birukoff, Marcel. Calorimeter. 4,345,844, Cl. 374-31.000.
Bisera, Jose; and Weil, Max H., to Institute of Critical Care Medicine. Closely controllable intravenous injection system. 4,345,594, Cl. 128-214.00F.
Bishop, John F., to Eastman Kodak Company. Two-sheet diffusion transfer elements. 4,346,160, Cl. 430-215.000.
BJ-Hughes Inc.: *See—*
Baker, Randy S.; and Eckmann, Gerald C., 4,345,653, Cl. 166-317.000.
Kuus, Felix, 4,345,648, Cl. 166-106.000.
Smith, Roger, Jr.; and Langowski, Faustyn C., 4,345,864, Cl. 414-22.000.
Blackburn, Richard D.; and Duclos, Donald A., to General Electric Company. Method and apparatus for automatic voltage reduction control. 4,346,341, Cl. 323-257.000.
Blahut, Donald E.; and Ukeiley, Richard L., to Bell Telephone Laboratories, Incorporated. Microcomputer using a double opcode instruction. 4,346,437, Cl. 364-200.000.
Blanc, Jacques; Coulon, Andre; and Pellus, Gilbert, to Alsthom-Atlantique; and TSM. Traitements de Surface et Mecanique. Method and apparatus for depositing metal in a large diameter cylindrical bore which passes through a large part. 4,345,977, Cl. 204-26.000.
Blauschild, Robert A., to Signetics Corporation. Stable field effect transistor voltage reference. 4,346,344, Cl. 323-313.000.
Blissett, Kitson; and Dunbar, Robert A., to Rothenhaus, Robert, a part interest. Control device responsive to infrared radiation. 4,346,427, Cl. 361-173.000.
Bloemers, James L., to Brunswick Corporation. Air and fuel induction system for a two cycle engine. 4,345,551, Cl. 123-59.00B.
Blossfeld, Lothar, to ITT Industries, Inc. Monolithic integrated threshold switch. 4,346,313, Cl. 307-350.000.
Blount, David H. Process for the production of organic alkali metal silicate compounds. 4,346,180, Cl. 521-100.000.
Blount, David H. Process for the production of alkali metal unsaturated polyester silicate resinous products. 4,346,185, Cl. 524-5.000.
Blount, David H. Process for the production of amine polysulfide silicate reaction products and their reaction products. 4,346,191, Cl. 524-710.000.
Blount, David H. Process for the production of organic alkali metal silicate compounds. 4,346,192, Cl. 524-788.000.
Blount, David H. Process for the production of polyester amide silicate resinous products. 4,346,214, Cl. 528-275.000.
Blout, Bennett O.; and Ruffolo, James C., to Evans Products Company. Modular freight bracing bulkhead assembly. 4,345,862, Cl. 410-134.000.
Blum, Alvin S. Solar diodes. 4,345,818, Cl. 350-259.000.
Board of Regents, University of Washington: *See—*
Allan, George G., 4,346,181, Cl. 521-136.000.
Bock, Robert E., to WPM, Inc. Water aerator. 4,345,719, Cl. 239-428.500.
Bockmann, August: *See—*
Schmidt, Adolf; Meier, Helmut; Schedrat, Gunther; and Bockmann, August, 4,346,203, Cl. 526-225.000.
Bockwinkel, Joe L.; and Pehl, Willis G., to Shakertown Corporation. Method of making rabbeted shingle butt joint sidewall panel. 4,345,630, Cl. 144-346.000.
Boden, Richard M., to International Flavors & Fragrances Inc. Branched ketones, organoleptic uses thereof and process for preparing same. 4,346,237, Cl. 568-398.000.
Boehringer Mannheim GmbH: *See—*
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Bartsch, Wolfgang; and Dietmann, Karl, 4,346,093, Cl. 424-269.000.
Boeing Company, The: *See—*
Brown, Robert B.; and Stepien, John A., 4,345,727, Cl. 244-102.00R.
Hilton, R. John, 4,346,134, Cl. 428-116.000.
Johnson, Walter J., 4,346,368, Cl. 340-347.0DA.
Loch, David M., 4,346,128, Cl. 427-328.000.
Warner, Gary J.; and Feifel, Winfried M., 4,345,538, Cl. 114-274.000.
Bohnhoff, Alan E.; Cassidy, Bruce M.; and Dyer, Stanley, to International Business Machines Corporation. Drive circuit for thermal printer. 4,345,845, Cl. 400-120.000.
Boliden Aktiebolag: *See—*
Fahlstrom, Per A. H. H.; and Gorling, Karl G., 4,345,990, Cl. 208-11.00R.
Boninchi S.A.: *See—*
Wenger, Karl, 4,346,464, Cl. 368-289.000.
Booe, James M.: *See—*
Perry, Ralph A.; and Booe, James M., 4,345,459, Cl. 73-61.10R.
Booker, Walter W.: *See—*
deBuhr, Harold E.; Booker, Walter W.; and Schmid, Steven L., 4,345,417, Cl. 56-14.300.
Boquiron, Rodolfo A.: *See—*
Mitteldorf, Arthur J.; Marcovecchio, Joseph; and Boquiron, Rodolfo A., 4,346,299, Cl. 378-204.000.
Borg-Warner Chemicals, Inc.: *See—*
Nichols, George M., 4,346,187, Cl. 524-83.000.
Borg-Warner Corporation: *See—*
Ross, Louis, 4,345,920, Cl. 55-46.000.
Borin, Frank W.; and Thomas, Jeffrey G. Test station apparatus for flush mounting. 4,346,254, Cl. 174-37.000.
Boring, Earl: *See—*
Moss, Theron C.; Boring, Earl; and Hjellum, Jerry, 4,345,351, Cl. 15-144.00B.
Borma B.V.: *See—*
de Groot, Hans; van den Heuvel, Eeuwoud; Barendrecht, Embrecht; and Janssen, Leonard J. J., 4,345,978, Cl. 204-74.000.
Bornat, Alan; and Clarke, Roy M., to Imperial Chemical Industries Limited; and University of Liverpool. Shaping process. 4,345,414, Cl. 53-425.000.
Borsos, Janos: *See—*
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.
Bosc, Henri J.; and Goyard, Pierre J., to International Standard Electric Corporation. Doppler radar for detection and localization of helicopters. 4,346,382, Cl. 343-5.0SA.
Bosits, Gyula: *See—*
Takacs, Istvan; Vereczkey, Endre; Bosits, Gyula; and Kerey, Gyorgy, 4,345,720, Cl. 241-74.000.
Bottoms, Harry S., to Lucas Industries Limited. Fuel pumping apparatus. 4,345,565, Cl. 123-497.000.
Boudreaux, Gordon J.: *See—*
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,346,043, Cl. 260-404.000.
Boughton, Matthew S., to Cannondale Corporation. Bottle mount and bottle for bicycles. 4,345,704, Cl. 224-39.000.
Bourns Instruments, Inc.: *See—*
Singh, Gurnam, 4,345,476, Cl. 73-720.000.
Bowser, Everett N. Test tube evaporator. 4,346,057, Cl. 422-101.000.
Bozik, John E.: *See—*
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,346,020, Cl. 252-429.00R.
Bozzuto, Carl R., to Combustion Engineering, Inc. Oxygen blown coal gasifier supplying MHD-steam power plant. 4,346,302, Cl. 290-1.00R.
BP Chemicals Limited: *See—*
Cadolle, Daniel, 4,346,013, Cl. 252-8.50A.
Braber, Robert J., to Abbott Laboratories. Assembly machine for I.V. components. 4,345,963, Cl. 156-423.000.
Bradford, Randol W., to Freeport Minerals Company. Dielectric pipe coupling for use in high temperature, corrosive environments. 4,345,785, Cl. 285-50.000.
Braibanti, Ennio, to Dott. Ingg. M., G. Braibanti & C. S.p.A. Process for the preparation of instant cooking alimentary paste. 4,346,119, Cl. 426-451.000.
Bratt, Jan C., to Kommanditbolaget United Stirling AB & CO. Hot gas engine heater head. 4,345,645, Cl. 165-176.000.
Braund, Darwin G.; Fronk, Thomas J.; Goings, Richard L.; Peters, John W.; and Steele, Robert L., to Agway, Inc. Method for reducing incidence of periparturient disorders in cows. 4,346,077, Cl. 424-156.000.
Bravo, Sergio M. Lock apparatus for storage tanks. 4,345,617, Cl. 137-385.000.
Breeden, Robert H., to Sperry Corporation. Power transmission. 4,345,435, Cl. 60-420.000.
Bretaudeau, Maurice: *See—*
Livet, Jean-Luc; and Bretaudeau, Maurice, 4,345,485, Cl. 74-5.100.
Breuer, Hans: *See—*
Obrist, Albert; and Breuer, Hans, 4,345,692, Cl. 215-252.000.
Breuninger, William F., to National Starch and Chemical Corporation. Method for dewatering starch slurries containing swollen starch granules. 4,345,948, Cl. 127-70.000.
Bridgestone Tire Co., Ltd.: *See—*
Takigawa, Hiroyoshi; and Miyamura, Nobuhiro, 4,345,632, Cl. 152-209.00R.
Ueda, Shigeo; and Fukuda, Yuji, 4,345,537, Cl. 114-219.000.

Bridwell, John W.; and Doyle, James R., to Caterpillar Tractor Co. Contaminant trap for fluid operated rotary actuator. 4,345,509, Cl. 92-78.000.

Briggs & Stratton Corporation: *See*—
Turner, Eugene D., 4,345,885, Cl. 418-90.000.

Brink, Gerhard: *See*—
Wegele, Gunther; Brink, Gerhard; Rotta, Goetz; Roeth, Manfred; and Wittmann, Siegfried, 4,345,907, Cl. 8-444.000.

Brislin, Patricia C. Universal measuring template. 4,345,381, Cl. 33-174.00G.

British Gas Corporation: *See*—
Burd, John F., 4,345,350, Cl. 15-104.06R.

British Petroleum Company Limited, The: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,346,021, Cl. 252-431.00N.

Brockel, Gerhard: *See*—
Muller, Arnold; and Brockel, Gerhard, 4,345,339, Cl. 3-1.000.

Brockmann, Klaus-Dieter K.; and van Harreveld, Teunis A., to U.S. Philips Corporation. Hybrid circuit. 4,346,266, Cl. 179-170.0NC.

Brogardh, Torgny: *See*—
Adolfsson, Morgan; and Brogardh, Torgny, 4,345,482, Cl. 73-862.590.

Brook, Marx: *See*—
Richards, Clyde N.; and Brook, Marx, 4,345,916, Cl. 55-5.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Inoue, Toyokazu, 4,346,334, Cl. 318-45.000.
Naganuma, Nobuyuki, 4,346,319, Cl. 310-36.000.

Brower, Boyd G.: *See*—
LeFever, Randall H.; and Brower, Boyd G., 4,345,895, Cl. 431-359.000.

Brower, Ronald W., to NCR Corporation. Self-aligned all-n^+ polysilicon CMOS process. 4,345,366, Cl. 29-571.000.

Brown, Arthur K., to Bendix Corporation, The. Load leveling air pump with pressure clutch. 4,345,773, Cl. 280-6.00R.

Brown, Edwin G.: *See*—
Woolcock, Sydney C.; and Brown, Edwin G., 4,346,383, Cl. 343-12.00R.

Brown, Hugh O.: *See*—
Gutierrez, William S.; Gropper, Lee; and Brown, Hugh O., 4,345,713, Cl. 233-1.00B.

Brown, Robert B.; and Stepien, John A., to Boeing Company, The. Body-braced main airplane landing gear. 4,345,727, Cl. 244-102.00R.

Brown, Robert L., to AMF Incorporated. Compensating well instrument. 4,345,454, Cl. 73-1.00E.

Brownstein, Raymond G. Laden fluid classifying process and apparatus. 4,346,011, Cl. 210-748.000.

Browwer Turf Equipment Limited: *See*—
Arnold, William T., 4,345,659, Cl. 180-131.000.

Bruderlein, Francois T.: *See*—
Humber, Leslie G.; Bruderlein, Francois T.; and Asselin, Andre A., 4,346,090, Cl. 424-258.000.

Brundin, Eike: *See*—
Bach, Hanswilhelm; Brundin, Eike; and Gick, Wilhelm, 4,346,239, Cl. 568-461.000.

Brunelli, Maurizio: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Brunelli, Maurizio, 4,346,188, Cl. 524-104.000.

Brunemann, James C. Apparatus for producing prefabricated modular building panels. 4,345,888, Cl. 425-117.000.

Brunner, Gerd: *See*—
Peter, Siegfried; Brunner, Gerd; and Riha, Rolf, 4,345,976, Cl. 203-49.000.

Brunswick Corporation: *See*—
Bloemers, James L., 4,345,551, Cl. 123-59.00B.

Bryans, Thomas J.; Miller, Richard H.; and Single, Arthur W., II, to Ford Motor Company. Child restraint system for a motor vehicle. 4,345,791, Cl. 297-250.000.

Brzack, Jeffrey A. Glider. 4,345,401, Cl. 46-79.000.

Bucher, Bernard P.: *See*—
Langlois, Michel; Lacour, Alain P.; Bucher, Bernard P.; and Mocquet, Gisele C., 4,346,102, Cl. 424-279.000.

Bucher Guyer A.G. Maschinenfabrik: *See*—
Amstutz, Jean-Pierre, 4,345,422, Cl. 56-370.000.

Buchi, George H.; and Wuest, Hans, to Firmenich SA. Process for the preparation of novel unsaturated macrocyclic ketones. 4,346,023, Cl. 252-522.00R.

Buhler, Otto R.; Gardner, Homer J.; and Marino, Peter T., to International Business Machines Corporation. Amplitude sensitive three-level detector for derivative read back channel of magnetic storage device. 4,346,411, Cl. 360-46.000.

Buijs, Henry L.; Vail, Garry L.; and Berube, Jean-Noel. Apparatus for spectrometer alignment. 4,345,838, Cl. 356-346.000.

Bukatarevic, Dragan. Control system for an electrically driven vehicle with three generators and flywheel energy conservation. 4,346,303, Cl. 290-45.000.

Bulgarsko Radio: *See*—
Kanchev, Peter K., 4,346,466, Cl. 369-250.000.

Bunyan, Clive N., to Rolls-Royce Limited. Lubricant tank. 4,345,699, Cl. 222-40.000.

Burd, John F., to British Gas Corporation. Pipeline cleaning equipment. 4,345,350, Cl. 15-104.06R.

Burdeska, Kurt; and Kabas, Guglielmo, to Ciba-Geigy Corporation. 6-Styrylquinoxalines, and their use as fluorescent brighteners. 4,346,016, Cl. 252-301.220.

Burke, Howard J.; and Hessler, Edward J., to Upjohn Company, The. Base catalyzed acylation with enol esters. 4,346,037, Cl. 260-239.55R.

Burke, James E., to Ethyl Products Company. Child resistant bottle closure. 4,345,691, Cl. 215-216.000.

Burr-Brown Research Corp.: *See*—
Albaugh, Neil P.; and Stitt, Robert M., 4,346,294, Cl. 250-227.000.

Burroughs Corporation: *See*—
Potash, Hanan; Levin, Burton L.; and Chan, Stephen J. C., 4,346,438, Cl. 364-200.000.
Volka, Lubomir J., 4,345,811, Cl. 339-143.00R.
Wallace, Harry L.; and Chambors, John M., 4,346,393, Cl. 346-140.00R.
Wise, John B., 4,346,435, Cl. 364-200.000.
Wise, John B., 4,346,436, Cl. 364-200.000.

Burroughs Wellcome Co.: *See*—
Wilkinson, Samuel, 4,346,083, Cl. 424-177.000.

Busby, Philip V. Drive mechanism for a vehicle trailer lifting gear. 4,345,779, Cl. 280-766.000.

Buss, Kenneth G.; and Culp, Norman L., to Texas Instruments Incorporated. Annunciator. 4,346,265, Cl. 179-84.00T.

Busta, Jiri: *See*—
Zobac, Ladislav; Malek, Zdenek; Soukup, Frantisek; Ryska, Antonin; Jelinek, Jan; and Busta, Jiri, 4,345,598, Cl. 128-303.100.

C Hemische Werke Huls Aktiengesellschaft: *See*—
Schulde, Felix; Peterlein, Karl; and Diedrich, Klaus, 4,346,204, Cl. 526-271.000.

C.N.E.N. Comitato Nazionale per l'Energia Nucleare: *See*—
Colmano, Riccardo, 4,345,549, Cl. 122-34.000.

Cadolle, Daniel, to BP Chemicals Limited. Thixotropic liquid and process for its production. 4,346,013, Cl. 252-8.50A.

Cahn, Robert P.; and Longo, John M., to Exxon Research & Engineering Co. Desulfurization of hot gas with cerium oxide. 4,346,063, Cl. 423-230.000.

Calgon Corporation: *See*—
Cornelius, Thomas E., III, 4,346,017, Cl. 252-321.000.

California Institute of Technology: *See*—
Goetz, Alexander F. H.; and Machida, Richard A., 4,345,840, Cl. 356-407.000.

Callaghan, William I.; and Ehinger, Charles P., to Towmotor Corporation. Wheel brake arrangement. 4,345,673, Cl. 188-18.00R.

Calvani, Menotti: *See*—
Cavazza, Claudio; and Calvani, Menotti, 4,346,107, Cl. 424-316.000.

Cameron, George R. Vacuum grass collecting apparatus. 4,345,416, Cl. 56-13.300.

Campbell, Charles M.: *See*—
McConnell, William K., Jr.; and Campbell, Charles M., 4,345,997, Cl. 210-150.000.

Campbell, Jeptha E.; and Gilchrist, James E., to Spiral Systems Inc. Gravimetric diluter. 4,345,628, Cl. 141-83.000.

Canadian Fram: *See*—
Cook, John E., 4,345,428, Cl. 60-274.000.

Canadian Patents & Development Ltd.: *See*—
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinivasa, 4,346,126, Cl. 427-209.000.

Canargo International Pty. Ltd.: *See*—
Romp, Frederick J., 4,346,286, Cl. 219-501.000.

Candid Logic, Inc.: *See*—
Vis, Arthur D., 4,345,380, Cl. 33-147.00N.

Cannondale Corporation: *See*—
Boughton, Matthew S., 4,345,704, Cl. 224-39.000.

Canon Kabushiki Kaisha: *See*—
Matsuyama, Shigeru, 4,346,450, Cl. 364-710.000.
Shinbori, Kenichi; Sakai, Shinji; Shinoda, Nobuhiko; Ito, Tadashi; and Murakami, Hiroyasu, 4,345,829, Cl. 354-37.000.

Carborundum Company, The: *See*—
Miller, Alton K., 4,345,545, Cl. 118-621.000.

Carl Freudenberg, Firma: *See*—
Seeh, Reinhold, 4,345,770, Cl. 277-48.000.

Carlson, Charles E., to Allied Corporation. High temperature pressure transducer system. 4,345,467, Cl. 73-309.000.

Carlson, Richard H.; and Gatcomb, Gerald L., to Du Pont de Nemours, E. I., and Company. Composite structure of an aromatic polyamide fabric coated with a fluorosilicone rubber. 4,346,140, Cl. 428-252.000.

Carmichael, William C. Apparatus to increase oil well flow. 4,345,647, Cl. 166-66.000.

Carollo, James A., to Rockwell International Corporation. Current limiting voltage regulator. 4,346,342, Cl. 323-276.000.

Carpenter, Neil L. Method and apparatus for recovering geopressured methane gas from ocean depths. 4,345,979, Cl. 204-101.000.

Carr, John F.: *See*—
Baines, Eric; and Carr, John F., 4,346,072, Cl. 424-49.000.

Carr, Stephen C. Pneumatic atomizing fire fighting supply truck. 4,345,654, Cl. 169-24.000.

Carra Officine Meccaniche S.p.A.: *See*—
Gianni, Carra, 4,345,386, Cl. 34-218.000.

Carrier Corporation: *See*—
Griffin, Charles K., 4,345,878, Cl. 417-15.000.

Carrigan, Donald G., to NCR Corporation. Method for fabricating an integrated circuit. 4,345,365, Cl. 29-571.000.

Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., to Western Electric Co., Inc.; and Bell Telephone Laboratories, Inc. Electronic device assembly and methods of making same. 4,346,396, Cl. 357-70.000.

Carswell, Angela M.: *See*—
Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., 4,346,212, Cl. 528-229.000.

Carter, Ernest A., to Motorola, Inc. Voltage booster circuit. 4,346,310, Cl. 307-264.000.

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Schulte, Wolfgang; and Castiglia, Giacinto, 4,345,892, Cl. 425-548.000.
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Ballheimer, Benny, 4,345,797, Cl. 308-122.000.
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Roussin, Michael A., 4,345,768, Cl. 277-22.000.
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CBS Inc.: *See*—
Jahns, Edward R., 4,345,502, Cl. 84-1.210.
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Forschirm, Alex S.; and Rosenthal, Arnold J., 4,346,209, Cl. 528-191.000.
Hall, Henry K., Jr.; and Padias, Anne B., 4,346,213, Cl. 528-272.000.
Lazear, Nelson R., 4,346,142, Cl. 428-315.700.
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Hipchen, Donald E.; Skowronski, Michael J.; and Hagan, Joseph R., 4,346,133, Cl. 428-109.000.
Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio; and Piretti, Giancarlo, 4,345,733, Cl. 248-561.000.
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Rassieur, Charles L., 4,345,493, Cl. 81-57.340.
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Gadoury, Andre; Pinheiro, Victor; and Pernicka, Martin, 4,345,344, Cl. 5-62.000.
Chabrolle, Jacques, to "L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques". Visual display apparatus for electrical signals recorded on a magnetic medium. 4,345,820, Cl. 350-362.000.
Chambers, George S., to J. P. Stevens & Co., Inc. Anti-siphoning device. 4,345,694, Cl. 220-86.0AT.
Chambers, Ramon P.: *See*—
Poston, Billy R.; Chambers, Ramon P.; and Gordy, Robert S., 4,346,480, Cl. 455-154.000.
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Wallace, Harry L.; and Chambors, John M., 4,346,393, Cl. 346-140.00R.
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Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, to Raychem Corporation. Polymeric articles. 4,345,957, Cl. 156-218.000.
Chapel, Roy W., Jr.; and Gurol, I. Macit, to John Fluke Mfg. Co., Inc. Thermally isolated monolithic semiconductor die. 4,346,291, Cl. 250-211.00R.
Chapman, Derek D.; and Reczek, James A., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible 6-arylazo-3-pyridinol magenta dye-releasing compounds and percursors thereof. 4,346,155, Cl. 430-17.000.
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Trent, Peter F.; and Charlebois, Raymond, 4,346,050, Cl. 264-71.000.
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Chase, James P., to Ampex Corporation. Method of manufacturing an extended life multichannel magnetic transducer. 4,345,367, Cl. 29-603.000.
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Wegele, Gunther; Brink, Gerhard; Rotta, Goetz; Roeth, Manfred; and Wittmann, Siegfried, 4,345,907, Cl. 8-444.000.
Chen, Thomas T., to Rockwell International Corporation. Crossover junction for magnetic bubble domain circuits 4,346,455, Cl. 365-16.000.
Cheng, Chen-Yen; and Cheng, Wu-Cheh. Cellular air bag insulation and insulator. 4,346,132, Cl. 428-76.000.
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Cheselka, Stephen. Spectacle hinge pin. 4,345,848, Cl. 403-157.000.
Cheung, Harry, to Union Carbide Corporation. Process for the production of high pressure oxygen gas. 4,345,925, Cl. 62-13.000.
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Muir, Francis, 4,346,461, Cl. 367-39.000.
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Basola, Carlo P.; and Chiaretti, Guido, 4,345,930, Cl. 65-102.000.
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Chierici, Osvaldo F., to Holland Company. Composite spin welded coupler carrier assembly. 4,345,689, Cl. 213-61.000.
China, David B., to Bermas Plastics Co., Inc. Tetrahedral gaming die with recessed pyramidal faces. 4,345,761, Cl. 273-146.000.
Ching, Larry K. W.: *See*—
Uba, Toshio; Ching, Larry K. W.; and Harrison, Michael R., 4,346,151, Cl. 429-54.000.
Choi, Jae H.; Mottine, John J., Jr.; Sparzak, Walter J., Sr.; and Vesperman, William C., to Western Electric Co., Inc.; and Bell Telephone Laboratories, Incorporated. Coating composition and coated articles. 4,346,145, Cl. 428-389.000.
Chow, Richard T.; Krauss, Clifford J.; and Ybema, Douwe, to Cominco Ltd. Electrowinning of zinc. 4,345,980, Cl. 204-119.000.
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Schouteeten, Alain; and Christidis, Yani, 4,346,238, Cl. 568-432.000.
Christner, Kurt W.: *See*—
Moseley, Gordon P.; and Christner, Kurt W., 4,345,576, Cl. 123-604.000.
Christopherson, Warren A., to International Business Machines Corporation. Integrated semiconductor current driver circuitry. 4,346,312, Cl. 307-270.000.
Chung, Seun Y. Man's briefs. 4,345,337, Cl. 2-405.000.
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Turner, George F. A. M., 4,346,300, Cl. 206-455.000.
Ciba-Geigy Corporation: *See*—
Burdeska, Kurt; and Kabas, Guglielmo, 4,346,016, Cl. 252-301.220.
Guth, Christian; Gysin, Hanspeter; and Binz, Jorg, 4,345,909, Cl. 8-477.000.
Maurer, Jurg; and Rembold, Heinz, 4,346,207, Cl. 528-103.000.
Sallmann, Alfred; and Baschang, Gerhard, 4,346,104, Cl. 424-309.000.
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Sharvit, Martin M., 4,346,264, Cl. 179-18.0DA.
Citizen Watch Company Limited: *See*—
Koni, Tuyoshi; Urushida, Yoshihisa; and Tsuzuki, Akira, 4,345,612, Cl. 137-101.190.
Morokawa, Shigeru; and Iwakura, Ryoji, 4,346,350, Cl. 331-116.0FE.
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Janniello, Frank, 4,346,419, Cl. 361-2.000.
Clark, Michael W.; and Martin, Barrie J., to Plessey Handel und Investments AG. Low pressure fuel injection system. 4,345,717, Cl. 239-102.000.
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Bornat, Alan; and Clarke, Roy M., 4,345,414, Cl. 53-425.000.
Clement, Philippe; and Rossi, Jean-Paul, to Lesaffre et Cie. Fermentation of acid-containing doughs. 4,346,115, Cl. 426-25.000.
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Berglund, Erling G.; and Krook, Hans J., 4,345,843, Cl. 366-219.000.
Clinicon International GmbH: *See*—
Paletta, Benno; Moller, Reinhard; and Kasielke, Joachim, 4,345,483, Cl. 73-864.160.
Cmelik, Helmut R. M.: *See*—
Basham, Edward R.; and Cmelik, Helmut R. M., 4,345,480, Cl. 73-861.770.
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Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., 4,346,212, Cl. 528-229.000.
Cobleigh, Wendall C.; Barmore, Donald L.; and Geschwender, Robert C., to Professional Marketing Associates. Film slitter. 4,345,497, Cl. 83-105.000.
Cochet, Gerard; and Provost, Gilbert, to Societe Anonyme dite: Carbonisation Entreprise et Ceramique. Pulverulent compositions and

refractory article obtained with said composition. 4,346,177, Cl. 501-123.000.
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Stemme, Otto; Lermann, Peter; and Cocron, Istvan, 4,345,827, Cl. 354-25.000.
Coe, Martha D. Walker with detachable seat. 4,345,790, Cl. 297-6.000.
Coe, Mary Ellen B., to NCR Corporation. End point detection using gas flow. 4,345,968, Cl. 156-627.000.
Cohen, Louis, to B. F. Goodrich Company, The. Shortstopping free radical polymerization of olefinic monomers. 4,346,202, Cl. 526-83.000.
Cole, Martin; and Edmondson, Robert A., to Beecham Group Limited. Process for the preparation of penicillin derivatives. 4,346,168, Cl. 435-43.000.
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Baines, Eric; and Carr, John F., 4,346,072, Cl. 424-49.000.
Colijn, Hendrik: *See—*
Gould, Gregory; and Colijn, Hendrik, 4,345,484, Cl. 73-864.430.
Collen, Desire J., to Leuven Research & Development V.Z.W. Antiplasmin and antiserum. 4,346,029, Cl. 260-112.00B.
Colmano, Riccardo, to Ansaldo Societa per Azioni; and C.N.E.N. Comitato Nazionale per l'Energia Nucleare. Steam-generator with improved facilities for replacement of parts. 4,345,549, Cl. 122-34.000.
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Bozzuto, Carl R., 4,346,302, Cl. 290-1.00R.
Fernandes, John H., 4,346,317, Cl. 310-11.000.
Randolph, Jeptha F.; and Stout, Donald L., 4,345,801, Cl. 308-238.000.
Wysk, Stanley R.; and Palkes, Mark, 4,346,316, Cl. 310-11.000.
Cominco Ltd.: *See—*
Chow, Richard T.; Krauss, Clifford J.; and Ybema, Douwe, 4,345,980, Cl. 204-119.000.
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Danel, Francois; Nicollet, Henri; Marchal, Paul; Robin, Marc; and Vertut, Jean, 4,345,658, Cl. 180-8.00C.
Compagnie Europeenne d'Accumulateurs: *See—*
Rigal, Michel; and Saerens, Jean, 4,346,153, Cl. 429-234.000.
Compagnie Francaise des Petroles: *See—*
Cortes, Abel C., 4,345,798, Cl. 308-160.000.
Conley, Bobby E., to Magnetic Peripherals, Inc. Read signal processing circuit. 4,346,412, Cl. 360-46.000.
Conrad, Lee R.: *See—*
Bakermans, Frank C.; and Conrad, Lee R., 4,345,955, Cl. 156-89.000.
Consiglio Nazionale Delle Ricerche: *See—*
Righini, Giancarlo; Sottini, Stefano; and Russo, Vera, 4,345,815, Cl. 350-96.180.
Continental Electronics, Inc.: *See—*
Hanna, George D., 4,346,354, Cl. 332-43.00B.
Continental Group, Inc., The: *See—*
Walter, John, 4,345,701, Cl. 222-569.000.
Contreras, Joseph P.; and Sass, George J., to Corona Plastics, Inc. Spring latch and hinge assembly for closure members. 4,345,607, Cl. 132-83.00R.
Control Concepts, Inc.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,345,736, Cl. 251-30.000.
Cook, John E., to Canadian Fram. Flow control valve for vehicle emissions control system. 4,345,428, Cl. 60-274.000.
Cook, Melvin A.: *See—*
McCarthy, Harry E.; French, Gordon B.; and Cook, Melvin A., 4,345,794, Cl. 299-2.000.
Cook, Melvin S. Method of producing thin single-crystal sheets. 4,345,967, Cl. 156-613.000.
Cooley, Denton A.: *See—*
Wilkinson, William R.; Sharp, Russell G.; Reed, Charles C.; Cooley, Denton A.; and Crane, Terry N., 4,345,919, Cl. 55-41.000.
Coolidge, John K.: *See—*
Patenaude, Raymond A.; Duke, Steven R.; and Coolidge, John K., 4,345,505, Cl. 89-154.000.
Coon, Clifford L.: *See—*
Levins, Donald A.; Bedford, Clifford D.; and Coon, Clifford L., 4,346,222, Cl. 544-322.000.
Cope, Leonard D.: *See—*
Baer, Ralph H.; and Cope, Leonard D., 4,346,407, Cl. 358-149.000.
Copenhaver, Richard L.: *See—*
Ernst, Donald M.; and Copenhaver, Richard L., 4,345,642, Cl. 165-86.000.
Coppens, Guillaume: *See—*
Gago, Ignace; and Coppens, Guillaume, 4,346,081, Cl. 424-130.000.
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., to Kennecott Corporation. Sintered alpha silicon carbide ceramic body having equiaxed microstructure. 4,346,049, Cl. 264-65.000.
Coquard, Jean; and Goletto, Jean, to Rhone-Poulenc Industries. Heat-stable polyphase polyamide/polyesteramide compositions. 4,346,024, Cl. 524-219.000.
Coquet, Andre: *See—*
Berchoux, Andre; and Coquet, Andre, 4,345,355, Cl. 19-0.600.
Cordes, Rudolph: *See—*
Hoffmann, Gerhart; Cordes, Rudolph; and Merkel, Wolfgang, 4,346,230, Cl. 560-99.000.
Cornelius, Thomas E., III, to Calgon Corporation. Method for controlling boiler water foaming. 4,346,017, Cl. 252-321.000.
Cornell, Robert W. Calendar. 4,345,392, Cl. 40-116.000.
Corning Glass Works: *See—*
Allaire, Roger A.; and VanDewoestine, Robert V., 4,345,528, Cl. 110-203.000.
Corona Plastics, Inc.: *See—*
Contreras, Joseph P.; and Sass, George J., 4,345,607, Cl. 132-83.00R.
Corsette, Douglas F. Designer's triangle. 4,345,383, Cl. 33-474.000.
Cortes, Abel C., to Compagnie Francaise des Petroles. Reduction in wear of contacting surfaces. 4,345,798, Cl. 308-160.000.
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Brunelli, Maurizio, to ANIC, S.p.A. Polyolefin compositions stabilized against UV-radiations by pyrrolidine derivatives. 4,346,185, Cl. 524-104.000.
Cote, Paul A. Building structure. 4,345,408, Cl. 52-169.300.
Coulon, Andre: *See—*
Blanc, Jacques; Coulon, Andre; and Pellus, Gilbert, 4,345,977, Cl. 204-26.000.
Coulter Electronics, Inc.: *See—*
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., 4,346,018, Cl. 252-408.000.
Coupry, Jean; and Anagnostidis, Marc, to Societe Metallurgique de Gerzat. Process for the manufacture of hollow bodies made of aluminum alloy and products thus obtained. 4,345,951, Cl. 148-2.000.
Coutant, Alan R., to Caterpillar Tractor Co. Control system for sequentially actuating fluid actuators. 4,345,508, Cl. 91-516.000.
Cowley, William E.; Shannon, Michael A.; and LeNir, Victor L., to Northern Telecom Limited. Control in application of pulp insulation to electrical conductors. 4,345,962, Cl. 156-356.000.
Cox, Russell C.; and McElroy, Arthur H., to Phillips Petroleum Company. Method for making a pipe connection or fitting. 4,345,956, Cl. 156-198.000.
Crane Co.: *See—*
McConnell, William K., Jr.; and Campbell, Charles M., 4,345,997, Cl. 210-150.000.
Zimmerman, Donald R., 4,346,005, Cl. 210-232.000.
Crane, Terry N.: *See—*
Wilkinson, William R.; Sharp, Russell G.; Reed, Charles C.; Cooley, Denton A.; and Crane, Terry N., 4,345,919, Cl. 55-41.000.
Crano, John C.; and Haynes, Ronald L., to PPG Industries, Inc. Method of polymerizing blends of bis (allyl carbonate) monomers with polymers and polymer blends prepared thereby. 4,346,197, Cl. 525-277.000.
Crathern Engineering Co., Inc.: *See—*
Mims, John D.; Mills, Leland F.; and Fowler, Ronald I., 4,345,960, Cl. 156-264.000.
Craven, James M., to Du Pont de Nemours, E. I., and Company. Powder coating composition for automotive topcoat. 4,346,144, Cl. 428-335.000.
Crawford, James J., to Frezzolini Electronics, Inc. Battery control system. 4,346,336, Cl. 320-9.000.
Craxton, Robert S., to University of Rochester, The. High power efficient frequency conversion of coherent radiation with nonlinear optical elements. 4,346,314, Cl. 307-427.000.
Crews, Harold R.: *See—*
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., 4,346,018, Cl. 252-408.000.
Crofts, Brian, to Rolls-Royce Limited. Bearing assembly. 4,345,799, Cl. 308-187.000.
Crosfield Electronics Limited: *See—*
Pugsley, Peter C., 4,346,402, Cl. 358-80.000.
Crouillere, Jean P., to Regie Nationale des Usines Renault. Process for the reduction of noxious gases from carburetor-equipped internal combustion engine during deceleration periods and apparatus for applying said process. 4,345,556, Cl. 123-327.000.
Crumley, Richard L.: *See—*
Herzl, Peter J.; Metzger, Harold W.; and Crumley, Richard L., 4,345,464, Cl. 73-201.000.
Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Basola, Carlo P.; and Chiaretti, Guido, 4,345,930, Cl. 65-102.000.
Cullinan, Edward J. Regenerative heat exchanger basket. 4,345,640, Cl. 165-10.000.
Cullum, Dennis F.; and Dorreboom, Jelmer, to Spin Physics, Inc. High density multitrack magnetic head. 4,346,418, Cl. 360-129.000.
Culp, Norman L.: *See—*
Buss, Kenneth G.; and Culp, Norman L., 4,346,265, Cl. 179-84.00T.
Cummins Engine Company, Inc.: *See—*
Kasting, Edward W.; Glasson, Richard E.; and Swank, Bryan W., 4,345,552, Cl. 123-90.380.
Cupper, Robert A.: *See—*
Somekh, George S.; and Cupper, Robert A., 4,346,015, Cl. 252-50.000.
Curchack, Herbert D.; and Hahn, A. David, to United States of America, Army. Multi-caliber projectile soft recovery system. 4,345,460, Cl. 73-167.000.
Curry, John L.: *See—*
Skaggs, William G.; and Curry, John L., 4,346,379, Cl. 340-778.000.
Cushing, Donald S., to General Electric Company. Manually actuated timer for appliances. 4,346,271, Cl. 200-38.00R.
D G Shelter Products Company: *See—*
Carvalho, Elmer R., 4,345,587, Cl. 126-450.000.
Dabrowski, Zdzislaw T. Lock guard. 4,345,787, Cl. 292-346.000.
Dagostino, Thomas P., to Tektronix, Inc. Position control circuit for a digital oscilloscope. 4,346,333, Cl. 315-367.000.

Daikin Kogyo Co., Ltd.: *See*—
Satokawa, Takaomi; Fujii, Tuneo; Ohmori, Akira; and Fujita, Yorio, 4,346,250, Cl. 568-842.000.
Sonoda, Noboru; Murai, Shinji; and Takii, Kazuhisa, 4,346,235, Cl. 562-596.000.

Dainippon Ink & Chemicals, Inc.: *See*—
Umaba, Toshihiko; and Ito, Tadashi, 4,346,012, Cl. 252-7.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Nomura, Norimasa; and Yoshimi, Yasuhito, 4,345,832, Cl. 354-320.000.

Dalton, Augustine I., Jr.; and Sircar, Shivaji, to Air Products and Chemicals, Inc. Stabilization and regeneration of activated carbon supported palladium chloride catalysts in the oxidation of vinyl halides. 4,346,019, Cl. 252-416.000.

Danel, Francois; Nicollet, Henri; Marchal, Paul; Robin, Marc; and Vertut, Jean, to Commissariat A l'Energie Atomique. Vehicle able to move by adhesion on a random surface. 4,345,658, Cl. 180-8.00C.

Danfoss A/S: *See*—
Hansen, Borge M., 4,345,441, Cl. 62-140.000.
Karlberg, Niels G.; and Pedersen, Poul H. H., 4,345,614, Cl. 137-340.000.

Dankowski, Detlef B. Oil cooler. 4,345,644, Cl. 165-154.000.

Daswick, Alexander C. Resilient inner sole for a shoe. 4,345,387, Cl. 36-43.000.

Datafile Limited: *See*—
Pfeffer, George B., 4,345,683, Cl. 198-653.000.

Daubignard, Jean-Michel, to Essilor International "Cie Generale d'Optique". Eyeglass frames openable at the bridge. 4,345,824, Cl. 351-98.000.

Davey, Kent R., to Westinghouse Electric Corp. Dynamoelectric machine having improved interleaved stator end turns. 4,346,320, Cl. 310-179.000.

Davidson, Thomas L., to Robertson Paper Box Co., Inc. Collapsible headlamp carton and blank for forming same. 4,345,687, Cl. 206-418.000.

Davis, James W., to Hercules Incorporated. Method of inducing lightwood formation in living conifers. 4,345,405, Cl. 47-10.000.

Davis, Michael A.; and Spivey, Bron W., to Akzona Incorporated. Textured novelty yarn and process. 4,345,424, Cl. 57-209.000.

Davis, Robert C., to Harris Corporation. Error correction coding method and apparatus for multilevel signaling. 4,346,473, Cl. 371-43.000.

Dawson, Stanley R.; and Hayes, Cecil L., to United States of America, Army. Heat exchanger base for a portable laser system. 4,345,643, Cl. 165-122.000.

Day, Roger W., to Geosource Inc. Multi-stage centrifugal mixer. 4,345,841, Cl. 366-2.000.

Dayton Wheel Products Company: *See*—
Schardt, James J., 4,345,795, Cl. 301-6.00E.

De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, to Alfa Romeo S.p.A. Regulation and control system for the fuel feeding unit of an internal-combustion engine. 4,346,443, Cl. 364-431.040.

Deavenport, Dennis L.; Howard, Kenneth J.; and Sidwell, Albert E., to Vertac Chemical Corporation. Preparation of 2,4,5-trichlorophenol and 2,4,5-trichlorophenoxyacetic acid free of 2,3,7,8-tetrachlorodibenzo-p-dioxin contamination. 4,346,248, Cl. 568-776.000.

De Boer, Albert. Tool holder device. 4,345,688, Cl. 211-60.00T.

deBuhr, Harold E.; Booker, Walter W.; and Schmid, Steven L., to Deere & Company. Forage harvester with kernel processing means. 4,345,417, Cl. 56-14.300.

Decker, Charles E.; and Hostetler, John L., to Republic Steel Corporation. Method and apparatus for thickness control of a coating. 4,346,129, Cl. 427-348.000.

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deBuhr, Harold E.; Booker, Walter W.; and Schmid, Steven L., 4,345,417, Cl. 56-14.300.
Madson, Lyle R., 4,345,490, Cl. 74-761.000.
Miller, Wayne R., 4,345,660, Cl. 180-133.000.

de Givry, Jacques, to MATRA. Process and apparatus for stripping insulated wires. 4,345,362, Cl. 29-426.500.

de Groot, Hans; van den Heuvel, Eeuwoud; Barendrecht, Embrecht; and Janssen, Leonard J. J., to Borma B.V. Method and apparatus for preparing aromatic hydrazo or diaminodiphenyl compounds. 4,345,978, Cl. 204-74.000.

De Heij, Nicolaas A., to Oce-Andeno B.V. Process for resolving DL-S-benzoyl-β-mercaptoisobutyric acid, and products obtained. 4,346,045, Cl. 260-455.00R.

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Langlois, Michel; Lacour, Alain P.; Bucher, Bernard P.; and Mocquet, Gisele C., 4,346,102, Cl. 424-279.000.

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Del Tufo, Mark J., to Litton Business Systems, Inc. Low profile reed keyswitch. 4,346,360, Cl. 335-205.000.

DeMatos, Henrique V., to Union Carbide Corporation. Multilayer ceramic capacitor with foil terminal. 4,346,429, Cl. 361-310.000.

Dennis, James T.; and Kolomayets, George, to Dennis, James T. Automatic record player. 4,346,465, Cl. 369-230.000.

Dent, Anthony L.; Derolf, M. Robert; and Hertzenberg, Elliot P., to PQ Corporation. Rehydrated silica gel dentifrice abrasive. 4,346,071, Cl. 424-49.000.

Deplante, Michel, to MATRA. Installation with automatic vehicles. 4,345,662, Cl. 180-168.000.

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Derail, Yves, to ASA S.A. Apparatus for the variable speed control of cams in textile machines. 4,345,721, Cl. 242-18.100.

Derolf, M. Robert: *See*—
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Derr, Leighton K.; Hawkins, Lyle B.; and Jones, Marlene J., to Hercules Incorporated. Reaction products of DMT process residue and dipropylene glycol. 4,346,229, Cl. 560-91.000.

Desloge, George B., to Watlow Electric Manufacturing Company. Electric heater and assembly. 4,346,287, Cl. 219-541.000.

DeStefano, Joseph: *See*—
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Deval, Alain, to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM. Electrostatic accelerometer. 4,345,474, Cl. 73-517.00B.

Devine, James A.; and Miletti, Jose A., to United States of America, Army. Air tunnel device for thermohygrometer. 4,345,469, Cl. 73-338.600.

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Diamond Shamrock Corporation: *See*—
Bennett, John E.; and Elliott, Joseph E., 4,345,981, Cl. 204-129.000.

Di Cicco, Angelo S.; and Quave, Walter N., to Kay Plastic Products, Inc. Multiphase modular chemical processing station. 4,345,615, Cl. 137-343.000.

Dickinson, William B.: *See*—
Lesher, George Y.; Dickinson, William B.; and Singh, Baldev, 4,346,221, Cl. 544-238.000.

Diedrich, Klaus: *See*—
Schulde, Felix; Peterlein, Karl; and Diedrich, Klaus, 4,346,204, Cl. 526-271.000.

Dietmann, Karl: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Bartsch, Wolfgang; and Dietmann, Karl, 4,346,093, Cl. 424-269.000.

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Riggle, Charles M.; Read, John D.; Noe, William B.; Winfrey, Richard; Pollard, Christopher A.; and Bernett, Frank W., 4,346,416, Cl. 360-106.000.

Dijkmans, Eise C., to U.S. Philips Corporation. Hybrid circuit. 4,346,267, Cl. 179-170.0NC.

DiMarco, Bernard: *See*—
Kussy, Frank W.; Heberlein, Gustave E., Jr.; and DiMarco, Bernard, 4,346,357, Cl. 335-16.000.

Dimension Weld International Corp.: *See*—
Kuroda, Minoru, 4,345,958, Cl. 156-221.000.

Dineen, John J., to Mechanical Technology Incorporated. Stirling engine control system. 4,345,437, Cl. 60-521.000.

Dios, Sandor: *See*—
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.

Dixit, Jagannath K. Automatic air pillow for diagnostic X-ray machine. 4,346,298, Cl. 5-441.000.

Doak, Kenneth; Bi, Le-Khac; and Milkovich, Ralph, to Atlantic Richfield Company. Clear impact resistant thermoplastic star-block copolymers. 4,346,198, Cl. 525-314.000.

Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie K.G., Apparatebau K.G.: *See*—
Sigdell, Jan-Erik; and Krick, Gerd, 4,345,999, Cl. 210-188.000.

Donaldson Company, Inc.: *See*—
Grassel, Eugene E., 4,345,922, Cl. 55-302.000.
Schoen, Donald W., 4,345,923, Cl. 55-314.000.

Dorler, Jack A.: *See*—
Berndlmaier, Erich; Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., 4,346,343, Cl. 323-282.000.

Dorman, Richard A., to Mechanical Technology Incorporated. Control system for resonant free-piston variable stroke compressor for load-following electric heat pumps and the like. 4,345,442, Cl. 62-160.000.

Dorr-Oliver Incorporated: *See*—
Leon, Albert M., 4,346,064, Cl. 423-244.000.

Dorreboom, Jelmer: *See*—
Cullum, Dennis F.; and Dorreboom, Jelmer, 4,346,418, Cl. 360-129.000.

Dorsemagen, Beate: *See*—
Faust, Uwe; Prave, Paul; Dorsemagen, Beate; and Hofer, Norbert, 4,346,113, Cl. 426-12.000.

Dott. Ingg. M., G. Braibanti & C. S.p.A.: *See*—
Braibanti, Ennio, 4,346,119, Cl. 426-451.000.

Doty, Jay, to Anderson Jacobsen, Inc. Low speed terminal interface for all-digital PABX. 4,346,259, Cl. 178-3.000.

Doudet, Michel, to Secim. Reverse extrusion press. 4,345,450, Cl. 72-273.500.

Doyle, James R.: *See*—
Bridwell, John W.; and Doyle, James R., 4,345,509, Cl. 92-78.000.

Drake, Cyril F., to International Standard Electric Corporation. Coating compositions for inhibiting corrosion of metal surfaces. 4,346,184, Cl. 523-451.000.

Drapeau, Raoul E.; and Stone, William M., to Scope Incorporated. Item display order picking system. 4,346,453, Cl. 364-900.000.

Dresser Industries, Inc.: *See*—
Rothwell, Thomas F.; and Smith, Gerald B., 4,345,961, Cl. 156-294.000.

Drews, Ulrich; Werner, Peter; and Mohrle, Werner, to Robert Bosch GmbH. Method and apparatus for regulating the fuel-air ratio in internal combustion engines. 4,345,562, Cl. 123-440.000.

Driard, Bertrand; Ricodeau, Jean; and Rougeot, Henri, to Thomson-CSF. Radiological image intensifier tube and radiological chain incorporating such a tube. 4,346,326, Cl. 313-388.000.

Droescher, Bernhard; and Zitz, Alfred, to Voest-Alpine Aktiengesellschaft. Device for controlling the position of a drift advancing machine. 4,345,839, Cl. 356-400.000.

du Boullay, Benoit T., to Institut Francais du Petrole. Seismic prospecting method providing for the determination of the flank dip of subterranean layers and device for carrying out the same. 4,346,462, Cl. 367-61.000.

Duclos, Donald A.: *See*—
Blackburn, Richard D.; and Duclos, Donald A., 4,346,341, Cl. 323-257.000.

Duda, Henry J. Furniture for converting a chair or settee into a lounge. 4,345,793, Cl. 297-438.000.

Duke, Steven R.: *See*—
Patenaude, Raymond A.; Duke, Steven R.; and Coolidge, John K., 4,345,505, Cl. 89-154.000.

Dunbar, Robert A.: *See*—
Blissett, Kitson; and Dunbar, Robert A., 4,346,427, Cl. 361-173.000.

Dunckhorst, William H. Timed shower head valve. 4,345,621, Cl. 137-624.120.

Du Pont de Nemours, E. I., and Company: *See*—
Abele, Werner, 4,346,162, Cl. 430-270.000.
Bakermans, Frank C.; and Conrad, Lee R., 4,345,955, Cl. 156-89.000.
Carlson, Richard H.; and Gatcomb, Gerald L., 4,346,140, Cl. 428-252.000.
Craven, James M., 4,346,144, Cl. 428-335.000.
Fawzi, Maged M., 4,346,220, Cl. 544-182.000.
Garlington, William D.; and Swerlick, Isadore, 4,346,215, Cl. 528-348.000.
Hoh, George L.; and Vassallo, Donald A., 4,346,196, Cl. 525-196.000.
Hyde, Thomas J., 4,346,183, Cl. 523-200.000.
Ida, Edward S., 4,346,371, Cl. 340-507.000.
Kachelries, Robert W., 4,345,831, Cl. 354-298.000.
Remington, William R., 4,346,141, Cl. 428-289.000.
Roura, Miguel J., 4,346,194, Cl. 525-66.000.
Simms, John A., 4,346,201, Cl. 525-440.000.
Tropea, Alfred, 4,346,130, Cl. 427-393.100.

Dutky, Samson R.: *See*—
Thompson, Malcolm J.; Mandava, Nagabhushanam; Worley, Joseph F., deceased; Meudt, Werner J.; Dutky, Samson R.; Robbins, William E.; and Flippen-Anderson, Judith L., 4,346,226, Cl. 549-268.000.

Dutremble, Joseph E.: *See*—
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Dyer, Stanley: *See*—
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Dynamit Nobel Aktiengesellschaft: *See*—
Hoffmann, Gerhart; Cordes, Rudolph; and Merkel, Wolfgang, 4,346,230, Cl. 560-99.000.

E. R. Squibb & Sons, Inc.: *See*—
Sudilovsky, Abraham, 4,346,106, Cl. 424-311.000.

E-Systems, Inc.: *See*—
Gordy, Robert S., 4,346,477, Cl. 455-257.000.
Poston, Billy R.; Chambers, Ramon P.; and Gordy, Robert S., 4,346,480, Cl. 455-154.000.

Eagle, Raymond S.; and Patel, Vishnu A., to Pullman Incorporated. Radial ammonia converters. 4,346,060, Cl. 422-148.000.

Eastman Kodak Company: *See*—
Bishop, John F., 4,346,160, Cl. 430-215.000.
Chapman, Derek D.; and Reczek, James A., 4,346,155, Cl. 430-17.000.
Holzhauser, Ronald C., 4,345,751, Cl. 271-3.100.
Krutak, James J.; Maleski, Robert J.; and Moore, William H., 4,346,161, Cl. 430-223.000.
Matteson, Lawrence J.; Greenwald, Roger J.; and Schauffele, Carl N., 4,345,825, Cl. 354-23.00D.
McLaen, Donald F.; and Herz, Arthur H., 4,346,154, Cl. 430-14.000.

Eaton Corporation: *See*—
Hansen, James E., 4,346,424, Cl. 361-94.000.
Wojtecki, Rudolph G.; and Kaan, Joseph P., 4,346,277, Cl. 219-528.000.

Eberle, William J., to General Battery Corporation. Cam shaft operated punch press for expanding lead alloy battery grid material. 4,345,452, Cl. 72-452.000.

Eberle, William J., to General Battery Corporation. Method of extrusion-fusion welding of lead parts through an aperture in a battery case. 4,346,282, Cl. 219-78.160.

Eberle, William J., to General Battery Corporation. Method of extruding, fusing and forging lead connections in battery cases. 4,346,283, Cl. 219-78.160.

Eckmann, Gerald C.: *See*—
Baker, Randy S.; and Eckmann, Gerald C., 4,345,653, Cl. 166-317.000.

Economou, Peter, to Yara Engineering Corporation. Structured kaolin agglomerates and methods of making the same. 4,346,178, Cl. 501-148.000.

Edahiro, Takao: *See*—
Kawachi, Masao; Tomaru, Satoru; Edahiro, Takao; and Suto, Shoichi, 4,345,928, Cl. 65-18.200.

Edmondson, Robert A.: *See*—
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Edwards, Finis E.: *See*—
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EG&G, Inc.: *See*—
Hayes, Stanley B., Jr., 4,345,455, Cl. 374-20.000.

Egert, Allen C., to Victor Equipment Co. Torch tubing clamping apparatus. 4,345,786, Cl. 285-131.000.

Egnell, Rolf A.; and Sjostedt, Carl-Goran. Device for burning fuel with air. 4,345,426, Cl. 60-39.230.

Eguchi, Yasukata, to Janome Sewing Machine Co. Ltd. Electronic sewing machine with back stitching system. 4,345,532, Cl. 112-158.00E.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,345,563, Cl. 123-458.000.

Ehinger, Charles P.: *See*—
Callaghan, William I.; and Ehinger, Charles P., 4,345,673, Cl. 188-18.00R.

Ehlers, Klaus-Peter: *See*—
Gradl, Reinhard; Schrodter, Klaus; Ehlers, Klaus-Peter; and Scheibitz, Wolfgang, 4,346,066, Cl. 423-321.00S.

Eichenlaub, Rolf; and Novakovic, Boris Z. Cutting wheel. 4,345,579, Cl. 125-15.000.

Eidson, James A. Exercising device. 4,345,755, Cl. 272-78.000.

Einstein, Harry: *See*—
Bellows, Richard J.; Grimes, Patrick G.; Newby, Kenneth R.; Einstein, Harry; and Tsien, Hsue C., 4,346,150, Cl. 429-18.000.

Eisai Co., Ltd.: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.

Ejiri, Yoshihiro: *See*—
Nakai, Taiichiro; Sato, Masanori; Furusawa, Kahei; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Ejiri, Yoshihiro, 4,345,816, Cl. 350-96.200.

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Moss, Lee C.; Knox, Phillip J.; and Snyder, Raymond W., 4,346,257, Cl. 174-72.00B.

Electronic Associates, Inc.: *See*—
Wilson, Wayne; Rosko, George; and Patmore, James R., 4,345,463, Cl. 73-190.0CV.

Elevator Equipment Co.: *See*—
Simpson, Elmer J.; and Rued, Glen A., 4,345,507, Cl. 91-449.000.

Elger, Walter: *See*—
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, 4,346,228, Cl. 560-53.000.

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Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., 4,346,094, Cl. 424-270.000.
Katner, Allen S., 4,346,076, Cl. 424-246.000.
Tao, Eddie V. P.; and Staten, Gilbert S., 4,346,225, Cl. 548-138.000.
Thibault, Thomas D., 4,345,935, Cl. 71-92.000.
Thibault, Thomas D.; and St. Clair, Roger L., 4,345,936, Cl. 71-92.000.
Vladuchick, William C., 4,346,219, Cl. 544-28.000.

Elkins, C. Edward, to Badger Meter, Inc. Signalling arrangement for telephone equipment. 4,346,263, Cl. 179-2.00A.

Elliott, Joseph E.: *See*—
Bennett, John E.; and Elliott, Joseph E., 4,345,981, Cl. 204-129.000.

Ellis, Victor C., to Sun-Woods Engineering Ltd. Solar heating apparatus. 4,345,585, Cl. 126-429.000.

El-Menshawy, Mohamed F.: *See*—
Bhattacharyya, Sushantha K.; and El-Menshawy, Mohamed F., 4,346,278, Cl. 219-69.00M.

Eltra Corporation: *See*—
Green, James A., 4,346,377, Cl. 340-731.000.
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Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.

Emhart Industries, Inc.: *See*—
Perry, Ralph A.; and Booe, James M., 4,345,459, Cl. 73-61.10R.
Stout, Garry A.; and Ray, Donald L., 4,346,270, Cl. 200-33.00R.

EMI Limited: *See*—
Woolcock, Sydney C.; and Brown, Edwin G., 4,346,383, Cl. 343-12.00R.

Endo, Fumihiro; Ishikawa, Toshio; Ozawa, Jun; Kamata, Yuzuru; and Shiono, Shigeo, to Hitachi, Ltd. Temperature measurement apparatus. 4,345,471, Cl. 374-188.000.
Endo, Takeyuki: *See*—
Huno, Takakazu; Endo, Takeyuki; Odaka, Kunihiro; and Shibuya, Yasutaka, 4,346,439, Cl. 364-200.000.
Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Klose, Peter H.; and Messing, Wayne P., 4,346,449, Cl. 364-900.000.
Enertron, Inc.: *See*—
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Enfors, Sven-Olof; Molin, Nils; and Montelin, Eugen, to Enfors, Sven-Olof; Molin, Nils; and Montelin, Eugen. Process for the microbiological modification of hardwood by the action of microorganisms. 4,346,175, Cl. 435-317.000.
Engel, John F., to FMC Corporation. 4-Substituted-2-indanols. 4,346,251, Cl. 568-808.000.
English Electric Company Limited, The: *See*—
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Enpoco Limited: *See*—
Garnett, Lawrence C., 4,345,789, Cl. 294-31.200.
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Erbstein, Robert S.; Richard, Gary R.; Palmatier, Roland T.; and McGill, Robert W., to Harris Corporation. Management and analysis system for web machines and the like. 4,346,446, Cl. 364-551.000.
Erickson, John W.: *See*—
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Ernst, Donald M.; and Copenhaver, Richard L., to Thermacore, Inc. Articulated heat pipes. 4,345,642, Cl. 165-86.000.
Erwin Sick GmbH - Optik-Elektronik: *See*—
Fetzer, Gunter, 4,346,293, Cl. 250-222.00R.
Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Phenoxy acetic acid derivative, its preparation and therapeutic use. 4,346,100, Cl. 424-275.000.
Essilor International "Cie Generale d'Optique": *See*—
Daubignard, Jean-Michel, 4,345,824, Cl. 351-98.000.
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Ethyl Corporation: *See*—
Hornbaker, Edwin D.; and Jones, Jesse D., 4,346,195, Cl. 525-176.000.
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Burke, James E., 4,345,691, Cl. 215-216.000.
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Eur-Control Kalle AB: *See*—
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Blout, Bennett O.; and Ruffolo, James C., 4,345,862, Cl. 410-134.000.
Exxon Research & Engineering Co.: *See*—
Bellows, Richard J.; Grimes, Patrick G.; Newby, Kenneth R.; Einstein, Harry; and Tsien, Hsue C., 4,346,150, Cl. 429-18.000.
Cahn, Robert P.; and Longo, John M., 4,346,063, Cl. 423-230.000.
Leighton, Milton D.; and Ryan, Douglas G., 4,346,008, Cl. 210-395.000.
Vernon, Lonnie W.; Veluswamy, Lavanga R.; Euker, Charles A., Jr.; and Mims, Charles A., 4,345,989, Cl. 208-10.000.
Wachter, William A., 4,346,067, Cl. 423-326.000.
Fag Kugelfischer Georg Schafer & Co.: *See*—
Hofmann, Heinrich; Markfelder, Gunther; and Bender, Hans-Eberhard, 4,345,800, Cl. 308-217.000.
Fahlstrom, Per A. H. H.; and Gorling, Karl G., to Boliden Aktiebolag. Method for recovering oil and/or gas from carbonaceous materials. 4,345,990, Cl. 208-11.00R.
Fahrenholz, Harley D. Rock picker with storage conveyors. 4,345,655, Cl. 171-63.000.
Faler, Gary R.; and Loucks, George R., to General Electric Company. Method and catalyst for making bisphenol. 4,346,247, Cl. 568-728.000.
Farrand Optical Co., Inc.: *See*—
Kallet, Eli A., 4,345,837, Cl. 356-317.000.
Faucz, Eugene C., to Xerox Corporation. Electrophotographic-magnetic duplex imaging structure and method. 4,346,156, Cl. 130-39.000.
Faust, Uwe; Prave, Paul; Dorsemagen, Beate; and Hofer, Norbert, to UHDE GmbH. Process for the continuous fermentation of aqueous slurries for the production of alcohol and yeast biomass. 4,346,113, Cl. 426-12.000.
Fawzi, Maged M., to Du Pont de Nemours, E. I., and Company. 1,2,4-Triazin-5-ones. 4,346,220, Cl. 544-182.000.
Fayolle, Bernard, to Rhone-Poulenc Industries. Anisotropic melts which can be shaped, based on aromatic polyesters, and articles formed from these melts. 4,346,208, Cl. 528-176.000.
Feder, Meinrad: *See*—
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Feenan, John; and Wafer, Ronald V., to English Electric Company Limited, The. Electric fuses with regions of reduced cross-sectional area. 4,346,362, Cl. 337-248.000.
Feifel, Winfried M.: *See*—
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Feldman, Julian, to National Distillers & Chemical Corp. Process for recovering ethanol from dilute aqueous solutions employing liquid extraction media. 4,346,241, Cl. 568-916.000.
Feldman, Norman: *See*—
Uyeda, Stanley T.; Radu, E. John; Talbot, William J., Jr.; and Feldman, Norman, 4,345,855, Cl. 405-168.000.
Fernandes, John H., to Combustion Engineering, Inc. Gasified coal-fired system. 4,346,317, Cl. 310-11.000.
Fetzer, Gunter, to Erwin Sick GmbH - Optik-Elektronik. Optical electronic distance sensor with a parallel beam of light and adjustable detector-emitter separation. 4,346,293, Cl. 250-222.00R.
Fichtel & Sachs AG: *See*—
Wossner, Felix; Handke, Gunther; and Koller, Manfred, 4,345,748, Cl. 267-8.00R.
Figueroa, Luis; and Yen, Huan-Wun, to Hughes Aircraft Company. Gallium arsenide burrus FET structure for optical detection. 4,346,394, Cl. 357-30.000.
Fink, Lothar: *See*—
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Finley, Donald G. Deflecting rocker arm for an internal combustion engine. 4,345,550, Cl. 123-78.00E.
Finley, Richard O.; and Stanwood, David A., to Plastiflex Company International. Self-sealing vacuum hose swivel fitting. 4,345,805, Cl. 339-16.00R.
Firmenich SA: *See*—
Buchi, George H.; and Wuest, Hans, 4,346,023, Cl. 252-522.00R.
Fischer, David. Partitioned carton. 4,345,711, Cl. 229-41.00R.
Fischer & Porter Company: *See*—
Herzl, Peter J.; Metzger, Harold W.; and Crumley, Richard L., 4,345,464, Cl. 73-201.000.
Fisher, Stanley P. Light weight run-off trough. 4,345,853, Cl. 405-119.000.
Fishman, Maurice J. Multi-unit dwellings. 4,345,407, Cl. 52-169.300.
Fisons Limited: *See*—
Gates, Peter S.; Gillon, John; and Saggers, David T., 4,345,932, Cl. 71-88.000.
Flanagan, Thomas P., to National Starch and Chemical Corporation. Adhesive for perfect bound books and method of using same. 4,345,349, Cl. 412-5.000.
Flemings, Merton C.; Riek, Rodney G.; and Young, Kenneth P., to Massachusetts Institute of Technology. Method for forming high fraction solid compositions by die casting. 4,345,637, Cl. 164-113.000.
Flippen-Anderson, Judith L.: *See*—
Thompson, Malcolm J.; Mandava, Nagabhushanam; Worley, Joseph F., deceased; Meudt, Werner J.; Dutky, Samson R.; Robbins, William E.; and Flippen-Anderson, Judith L., 4,346,226, Cl. 549-268.000.
Fluxcom, Inc.: *See*—
Baumann, John S.; Knipp, Roger W.; and Kacin, Joseph J., 4,346,426, Cl. 361-151.000.
FMC Corporation: *See*—
Engel, John F., 4,346,251, Cl. 568-808.000.
Lee, Fui-Tseng H., 4,346,236, Cl. 568-15.000.
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Fohl, Artur, to REPA Feinstanzwerk GmbH. Safety belt system for motor vehicles. 4,345,665, Cl. 180-270.000.
Fontana, Nando A.: *See*—
Magrane, Robert T.; and Fontana, Nando A., 4,345,553, Cl. 123-149.00C.
Ford Motor Company: *See*—
Bryans, Thomas J.; Miller, Richard H.; and Single, Arthur W., II, 4,345,791, Cl. 297-250.000.
Forschirm, Alex S.; and Rosenthal, Arnold J., to Celanese Corporation. Solvent resistant halogenated aromatic polyester fibers and process therefor. 4,346,209, Cl. 528-191.000.
Foster, Edward T. Fuel saving aircraft descent calculator. 4,346,288, Cl. 235-70.00A.
Foucras, Jacques; and Rodet, Georges, to Rhone-Poulenc Industries. Securing means for the leakproof mounting of a semi-permeable membrane to a support plate. 4,346,004, Cl. 210-232.000.
Fowler, Ronald I.: *See*—
Mims, John D.; Mills, Leland F.; and Fowler, Ronald I., 4,345,960, Cl. 156-264.000.
Fox, Lawrence E.: *See*—
Woody, Albert L.; Fox, Lawrence E.; and Reinsma, Harold L., 4,345,772, Cl. 277-212.0FB.
Francis, William H.; and Natter, Eckard F., to Bendix Corporation, The. Rotating and translating radar antenna drive system. 4,346,386, Cl. 343-765.000.
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Bradford, Randol W., 4,345,785, Cl. 285-50.000.
French, Gordon B.: *See*—
McCarthy, Harry E.; French, Gordon B.; and Cook, Melvin A., 4,345,794, Cl. 299-2.000.
French, John M., Jr.: *See*—
Gillespie, Donald R.; and French, John M., Jr., 4,345,710, Cl. 229-16.00R.
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Sugier, Andre; Freund, Edouard; and Le Page, Jean-Francois, 4,346,179, Cl. 518-707.000.
Frezzolini Electronics, Inc.: *See*—
Crawford, James J., 4,346,336, Cl. 320-9.000.
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Bartsch, Wolfgang; and Dietmann, Karl, to Boehringer Mann-

heim GmbH. Heterocyclic oxypropanolamine compounds and pharmaceutical compositions. 4,346,093, Cl. 424-269.000.
Frieder, Leonard P., Jr.; and Lavender, Michael R., to Gentex Corporation. Custom-fitted helmet and method of making same. 4,345,338, Cl. 2-414.000.
Friedmann, Charles A. Treatment for arthritis and substances for use in such treatment. 4,346,103, Cl. 424-308.000.
Friedrich, Heinz: *See*—
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Frister, Manfred, to Robert Bosch GmbH. Slip ring retainer mechanism. 4,346,321, Cl. 310-232.000.
Fronk, Thomas J.: *See*—
Braund, Darwin G.; Fronk, Thomas J.; Goings, Richard L.; Peters, John W.; and Steele, Robert L., 4,346,077, Cl. 424-156.000.
Fu, Yiu: *See*—
Keung, Poon C.; and Fu, Yiu, 4,345,447, Cl. 70-38.00A.
Fuji Photo Film Co., Ltd.: *See*—
Imatomi, Eiji; Ogawa, Tsuyoshi; and Hamaoka, Tsutomu, 4,346,167, Cl. 430-569.000.
Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, 4,346,409, Cl. 358-280.000.
Kato, Hisatoyo; and Ishida, Masamitsu, 4,346,406, Cl. 358-110.000.
Ohara, Yuji, 4,346,401, Cl. 358-75.000.
Sawada, Satoru; Oono, Shigeru; Seto, Nobuo; Suzuki, Yoshiaki; Nakamura, Kotaro; and Furutachi, Nobuo, 4,346,165, Cl. 430-372.000.
Tanaka, Kazuyoshi; Kato, Hisatoyo; and Matsumoto, Seiji, 4,346,295, Cl. 250-327.200.
Fuji Xerox Co., Ltd.: *See*—
Sadamatsu, Shigeru; Pu, Lyon S.; and Ishikawa, Yoshihisa, 4,346,159, Cl. 430-67.000.
Fujii, Tuneo: *See*—
Satokawa, Takaomi; Fujii, Tuneo; Ohmori, Akira; and Fujita, Yorio, 4,346,250, Cl. 568-842.000.
Fujimoto, Ted T., to Rohm and Haas Company. Method of producing hybrid cereal grain seeds by application of 1-aryl-1,4-dihydro-4-oxo(-thio)-pyridazines. 4,345,934, Cl. 71-92.000.
Fujita, Hideaki: *See*—
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Fujitsu Limited: *See*—
Kinoshita, Ryoichi; and Orihara, Shobu, 4,346,456, Cl. 365-36.000.
Yamasawa, Masao; Ohhata, Michinobu; and Ikezawa, Toshi, 4,346,476, Cl. 375-8.000.
Fujiwara, Kohei; and Hosogai, Setsuo, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with increased contact separation. 4,346,356, Cl. 335-6.000.
Fujiwara, Sigeharu: *See*—
Mayumi, Masakatsu; Mitooka, Kenji; and Fujiwara, Sigeharu, 4,345,625, Cl. 138-141.000.
Fujizoki Pharmaceutical Co., Ltd.: *See*—
Yasuda, Takamasa, 4,346,174, Cl. 435-189.000.
Fukasawa, Akira; and Ueda, Minoru, to Agency of Industrial Science & Technology. Coated electrode and a method of its production. 4,345,987, Cl. 204-290.00R.
Fukuchi, Shigeki, to Metako Kigyo Co., Ltd. Roller screen unit. 4,345,636, Cl. 160-297.000.
Fukuda, Mamoru. Continuous suturing device. 4,345,601, Cl. 128-339.000.
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Funato, Masayoshi: *See*—
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Furuno Electric Co., Ltd.: *See*—
Sato, Yuji; and Koizumi, Shoji, 4,346,391, Cl. 346-136.000.
Furusawa, Kahei: *See*—
Nakai, Taiichiro; Sato, Masanori; Furusawa, Kahei; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Ejiri, Yoshihiro, 4,345,816, Cl. 350-96.200.
Furutachi, Nobuo: *See*—
Sawada, Satoru; Oono, Shigeru; Seto, Nobuo; Suzuki, Yoshiaki; Nakamura, Kotaro; and Furutachi, Nobuo, 4,346,165, Cl. 430-372.000.
Fushimi, Takashi: *See*—
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Gadoury, Andre; Pinheiro, Victor; and Pernicka, Martin, to Centre de Recherche Industrielle du Quebec. Hospital bed. 4,345,344, Cl. 5-62.000.
GAF Corporation: *See*—
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,346,190, Cl. 524-522.000.
Schneider, Louis; and Graham, David E., 4,345,937, Cl. 71-95.000.
Gagliani, John; and Lee, Raymond, to International Harvester Company. Polyimides. 4,346,182, Cl. 521-189.000.
Gago, Ignace; and Coppens, Guillaume, to Interox (Societe Anonyme). Compositions for ingestion by ruminants to remove protozoa, process for their preparation and use of these compositions for the feeding of ruminants. 4,346,081, Cl. 424-130.000.
Gajewski, Robert P.: *See*—
Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., 4,346,094, Cl. 424-270.000.
Gale, Edwin J., to Stanley Aviation Corp. Coupling assembly with bonding jumper. 4,346,428, Cl. 361-215.000.
Gallegos, Manuel. Supporting bracket for musical instruments. 4,345,732, Cl. 248-441.00B.
Galloway, Dean K.: *See*—
Galloway, James V., deceased; and Galloway, Scott, 4,345,695, Cl. 220-254.000.
Galloway, James V., deceased (by Galloway, Dean K.); and Galloway, Scott. Lid for a drinking cup. 4,345,695, Cl. 220-254.000.
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Galloway, James V., deceased; and Galloway, Scott, 4,345,695, Cl. 220-254.000.
Gantenbrink, Rudolf. Monitoring camera. 4,346,404, Cl. 358-99.000.
Garbuz, Evgeny I.: *See*—
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Gardner, Homer J.: *See*—
Buhler, Otto R.; Gardner, Homer J.; and Marino, Peter T., 4,346,411, Cl. 360-46.000.
Gargani, Pietro. Process for the preparation of the sodium salt of mercaptopropionylglycine. 4,346,234, Cl. 562-556.000.
Garlington, William D.; and Swerlick, Isadore, to Du Pont de Nemours, E. I., and Company. Film of aromatic polyamide and process therefor. 4,346,215, Cl. 528-348.000.
Garnett, David M. Roller conveyors. 4,345,678, Cl. 193-35.00R.
Garnett, Lawrence C., to Enpoco Limited. Carrying device for cylindrical tanks. 4,345,789, Cl. 294-31.200.
Garrett, John M.; and King, Kenneth G., to Westinghouse Brake and Signal Co., Ltd. Controllable rectifier circuit. 4,346,309, Cl. 307-252.00M.
Garrett, Thomas B.; Herweh, John E.; Magnusson, Alan B.; and Miller, Normal L., to Armstrong World Industries, Inc. Process for fixing photo-induced colored derivatives of spiropyrans and compositions therefor. 4,346,186, Cl. 524-82.000.
Gaset, Antoine: *See*—
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Gatcomb, Gerald L.: *See*—
Carlson, Richard H.; and Gatcomb, Gerald L., 4,346,140, Cl. 428-252.000.
Gates, James T. Humidifying system for mobile vehicles. 4,346,048, Cl. 261-130.000.
Gates, Peter S.; Gillon, John; and Saggers, David T., to Fisons Limited. Herbicides. 4,345,932, Cl. 71-88.000.
Gates Rubber Company, The: *See*—
Uba, Toshio; Ching, Larry K. W.; and Harrison, Michael R., 4,346,151, Cl. 429-54.000.
Gaunt, Frank L. Very low flow rate lubricant metering apparatus and method for a tool and workpiece. 4,345,668, Cl. 184-29.000.
Gay Freres S.A.: *See*—
Gay, Jacques-Hubert, 4,345,444, Cl. 63-4.000.
Gay, Jacques-Hubert, to Gay Freres S.A. Metallic bracelet. 4,345,444, Cl. 63-4.000.
Gearhart Industries, Inc.: *See*—
Terrell, Jamie B., 4,345,646, Cl. 166-55.000.
Geerling, Leonardus J. Automatic audiological analyzer. 4,346,268, Cl. 179-175.10A.
Geiger, David. Construction method. 4,345,410, Cl. 52-741.000.
Geimuplast Peter Mundt GmbH & Co., KG: *See*—
Urban, Otfried; and Mundt, Peter, 4,345,707, Cl. 226-68.000.
General Battery Corporation: *See*—
Eberle, William J., 4,345,452, Cl. 72-452.000.
Eberle, William J., 4,346,282, Cl. 219-78.160.
Eberle, William J., 4,346,283, Cl. 219-78.160.
General Electric Company: *See*—
Balchunas, Charles A., 4,345,389, Cl. 38-77.700.
Blackburn, Richard D.; and Duclos, Donald A., 4,346,341, Cl. 323-257.000.
Cushing, Donald S., 4,346,271, Cl. 200-38.00R.
Faler, Gary R.; and Loucks, George R., 4,346,247, Cl. 568-728.000.
Heft, Eldon B., 4,346,358, Cl. 335-16.000.
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,345,504, Cl. 89-37.0GM.
Krabbenhoft, Herman O., 4,346,249, Cl. 568-782.000.
Labbe, Donald E.; and Dutremble, Joseph E., 4,345,438, Cl. 60-657.000.
Lupinski, John H., 4,346,136, Cl. 428-213.000.
O'Hara, Kevin S., 4,345,950, Cl. 148-2.000.
Patenaude, Raymond A.; Duke, Steven R.; and Coolidge, John K., 4,345,505, Cl. 89-154.000.
Reed, Bradley O., 4,345,488, Cl. 74-682.000.
Sauer, George E., 4,346,361, Cl. 336-60.000.
Steigerwald, Robert L., 4,346,431, Cl. 363-27.000.
Stoll, Donald H., 4,346,272, Cl. 200-83.00C.
Vakil, Himanshu B.; and Kosky, Philip G., 4,345,915, Cl. 48-197.00R.
Walden, John P., 4,346,332, Cl. 315-307.000.
Watrous, Donald L., 4,346,337, Cl. 322-25.000.

Wolcott, Edward O.; and Wentzel, Frank W., Jr., 4,346,022, Cl. 252-509.000.
General Electric Company, Limited, The: *See*—
Insam, Howard F.; and Laurenson, Stephen R., 4,346,448, Cl. 364-607.000.
General Foods Corporation: *See*—
Price, Charles E.; Ray, George C., III; Grieve, Harold R.; and Tomich, Robert G., 4,345,393, Cl. 40-312.000.
Gentex Corporation: *See*—
Frieder, Leonard P., Jr.; and Lavender, Michael R., 4,345,338, Cl. 2-414.000.
Georg Fischer Aktiengesellschaft: *See*—
Baumann, Gerhard, 4,345,361, Cl. 29-237.000.
George, Peter K., to National Semiconductor Corporation. Bubble memory with on chip error map storage on permalloy disk elements. 4,346,454, Cl. 365-15.000.
Geosource Inc.: *See*—
Day, Roger W., 4,345,841, Cl. 366-2.000.
Williams, Henry L., 4,345,539, Cl. 116-68.000.
Gerber Garment Technology, Inc.: *See*—
Pearl, David R., 4,345,496, Cl. 83-100.000.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Imidazodiazepine derivatives. 4,346,030, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Process for preparing imidazodiazepines. 4,346,031, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Imidazodiazepine derivatives. 4,346,032, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Thienodiazepinone and benzodiazepinone intermediates. 4,346,033, Cl. 260-239.30B.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Process for preparing imidazodiazepines. 4,346,034, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Process for preparing imidazodiazepines. 4,346,035, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, to Hoffmann-La Roche Inc. Process for preparing imidazodiazepine derivatives. 4,346,036, Cl. 260-239.30T.
Gereg, Gordon A. Lung exerciser. 4,345,605, Cl. 128-728.000.
Gerety, Robert J.: *See*—
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Geschwender, Robert C.: *See*—
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Gianni, Carra, to Carra Officine Meccaniche S.p.A. Air agitation device. 4,345,386, Cl. 34-218.000.
Gianutsos, Gerald: *See*—
Henkel, James G.; and Gianutsos, Gerald, 4,346,112, Cl. 424-325.000.
Gick, Wilhelm: *See*—
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Gilchrist, James E.: *See*—
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Gilhaus, Konrad: *See*—
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Gillespie, Donald R.; and French, John M., Jr. Temporary material receptacle. 4,345,710, Cl. 229-16.00R.
Gillette Company, The: *See*—
Jacobson, Chester F., 4,345,374, Cl. 30-47.000.
Gillon, John: *See*—
Gates, Peter S.; Gillon, John; and Saggers, David T., 4,345,932, Cl. 71-88.000.
Gilmore, Oscar P. Webbed non-pneumatic tire. 4,345,633, Cl. 152-328.000.
Gilmour, Neil J. L.; Martin, William B.; Sharp, James M.; Thompson, Dennis A.; and Wells, Peter W., to National Research Development Corp. Pasteurellosis vaccines. 4,346,074, Cl. 424-92.000.
Gim, Heung S. Plastic bag. 4,345,712, Cl. 229-62.000.
Giorgini, Eugene A.; and Sullivan, John L., to A-T-O Inc. Pressure demand regulator with automatic shut-off. 4,345,592, Cl. 128-204.260.
Giovannetti, Giusto, to Pegasus Pension Fund S.A. Method of producing plants mycorrhyzated with symbiotic fungi. 4,345,403, Cl. 47-1.100.
Giron, Daniel G., to Michelin Recherche et Technique S.A. Tire for medium and heavy carrier vehicles. 4,345,634, Cl. 152-353.00R.
Givelet, Sebastien: *See*—
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Glaser, Hans F. Vise. 4,345,750, Cl. 269-136.000.
Glasson, Richard E.: *See*—
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Gless, Richard D.: *See*—
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Glukhikh, Rudolf G.: *See*—
Lezgintsev, Georgy M.; Garbuz, Evgeny I.; Kontar, Evgeny A.; Glukhikh, Rudolf G.; Murdmaa, Ivar O.; Soluyanov, Vadim G.; Belyavsky, Alexandr S.; and Kuznetsov, Alexei N., 4,345,461, Cl. 73-170.00A.
Goddard, John B., to Union Carbide Corporation. Purification of ammonium tungstate solutions. 4,346,061, Cl. 423-56.000.
Goedert, Ferdinand: *See*—
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Goetz, Alexander F. H.; and Machida, Richard A., to California Institute of Technology. Method and apparatus for instantaneous band ratioing in a reflectance radiometer. 4,345,840, Cl. 356-407.000.
Goings, Richard L.: *See*—
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Goldberg, Alan, to H. Krantz GmbH & Co. Equipment for drying and/or shrinking of tubular textile structures. 4,345,357, Cl. 26-18.500.
Goldsmith, Norman; and Perrucci, Joseph W., to Perrucci, Joseph W. Portable can crushing apparatus. 4,345,520, Cl. 100-293.000.
Goletto, Jean: *See*—
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Goltz, Kurt: *See*—
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Gordy, Robert S., to E-Systems, Inc. Phase locked sampling radio receiver. 4,346,477, Cl. 455-257.000.
Gordy, Robert S.: *See*—
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Gorling, Karl G.: *See*—
Fahlstrom, Per A. H. H.; and Gorling, Karl G., 4,345,990, Cl. 208-11.00R.
Goss, David C.; and Springs, Daniel R., to Thermon Manufacturing Co. Parallel-type heating cable and method of making same. 4,345,368, Cl. 29-611.000.
Goto, Fumio; Yoshino, Kenji; Kono, Hiroshi; and Naito, Mitsuaki, to Niigata Engineering Co., Ltd.; and Nippon Hodo Co., Ltd. Leveling device for asphalt finisher. 4,345,852, Cl. 404-114.000.
Gould, Gregory; and Colijn, Hendrik. Sampling device. 4,345,484, Cl. 73-864.430.
Gould Inc.: *See*—
Kussy, Frank W.; Heberlein, Gustave E., Jr.; and DiMarco, Bernard, 4,346,357, Cl. 335-16.000.
Rider, Thomas F., 4,345,624, Cl. 138-110.000.
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Graber, Joseph V. Automobile attached carrier. 4,345,705, Cl. 224-42.03B.
Gradl, Reinhard; Schrodter, Klaus; Ehlers, Klaus-Peter; and Scheibitz, Wolfgang, to Hoechst Aktiengesellschaft. Purification of wet-process phosphoric acid. 4,346,066, Cl. 423-321.00S.
Graffis, Kelly R.; and Sievert, Bruce G. Plastic catch basin. 4,345,998, Cl. 210-164.000.
Graham, David E.: *See*—
Schneider, Louis; and Graham, David E., 4,345,937, Cl. 71-95.000.
Granda, Edward J.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,346,243, Cl. 568-591.000.
Granzer, Ernold: *See*—
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Grassel, Eugene E., to Donaldson Company, Inc. Air cleaner with anti-reentrainment. 4,345,922, Cl. 55-302.000.
Grassi, Gloria. Method and apparatus for producing day-night pictures. 4,345,395, Cl. 40-441.000.
Gray, Billy C. Mass magnetic tape degaussing system. 4,346,425, Cl. 361-151.000.
Gray, Ralph C.: *See*—
Young, Charles L., Jr.; and Gray, Ralph C., 4,346,143, Cl. 428-332.000.
Green, James A., to Eltra Corporation. Method and apparatus for encoding and generating characters in a display. 4,346,377, Cl. 340-731.000.
Greene, Larry D., to Acco Industries Inc. Loader-unloader system for work pieces. 4,345,866, Cl. 414-224.000.
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Matteson, Lawrence J.; Greenwald, Roger J.; and Schauffele, Carl N., 4,345,825, Cl. 354-23.00D.
Gregg, F. Browne. Vessel raising heavy structures. 4,345,536, Cl. 114-124.000.
Gregoire, Clyde G., to Baldwin-Gregg, Inc. Cam operated grippers for printed webs. 4,345,906, Cl. 493-432.000.
Grey, Roger A.; and Pez, Guido P., to Allied Corporation. Hydrogenation of esters using alkali doped heterogeneous group VIII transition metal catalysts. 4,346,240, Cl. 568-842.000.

Grieve, Harold R.: *See*—
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Griffin, Charles K., to Carrier Corporation. Apparatus for changing belts. 4,345,878, Cl. 417-15.000.
Griffin, Jewell C., Jr.: *See*—
Motley, Larry L., 4,345,406, Cl. 52-8.000.
Griffith, Edward J., to Monsanto Company. Asbestiform crystalline calcium sodium or lithium phosphate, preparation and compositions. 4,346,028, Cl. 524-417.000.
Griffith, Neil J., to Spin Physics, Inc. Selectively actuable magnetic head. 4,346,417, Cl. 360-115.000.
Grimes, Patrick G.: *See*—
Bellows, Richard J.; Grimes, Patrick G.; Newby, Kenneth R.; Einstein, Harry; and Tsien, Hsue C., 4,346,150, Cl. 429-18.000.
Groff, James W. Classroom noise alarm. 4,346,374, Cl. 340-573.000.
Grollimund, Everett C.; and Martin, Peter, to Philip Morris Incorporated. Dual path web transport and processing apparatus with radiant energy directing means. 4,346,284, Cl. 219-121.0LK.
Gropper, Lee: *See*—
Gutierrez, William S.; Gropper, Lee; and Brown, Hugh O., 4,345,713, Cl. 233-1.00B.
Grove Valve and Regulator Company: *See*—
Ripert, Roger L., 4,345,738, Cl. 251-315.000.
Groves, Stanley E., to Motorola, Inc. NRZ/Biphase microcomputer serial communication logic. 4,346,452, Cl. 364-900.000.
Growdon, John H.; and Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for treating disorders by administering lithium and choline. 4,346,084, Cl. 424-199.000.
Growdon, John H.; and Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for treating disorders by administering amphetamine and choline. 4,346,085, Cl. 424-199.000.
Grundstrom, Karl-Johan: *See*—
Norman, Bo; and Grundstrom, Karl-Johan, 4,346,007, Cl. 210-360.100.
Gruner, Heiko; and Friedrich, Heinz, to Robert Bosch GmbH. Probe for measuring flow rate and/or temperature of a flowing medium. 4,345,465, Cl. 73-204.000.
GTE Products Corporation: *See*—
LeFever, Randall H.; and Brower, Boyd G., 4,345,895, Cl. 431-359.000.
Guidote, Armando E.: *See*—
Alegre, Adolfo P.; Guidote, Armando E.; and Puyat, Alfonso G., 4,345,568, Cl. 123-522.000.
Guimarin Container Co., Incorporated: *See*—
Guimarin, Henry L., 4,345,696, Cl. 220-277.000.
Guimarin, Henry L., to Guimarin Container Co., Incorporated. Container opening apparatus. 4,345,696, Cl. 220-277.000.
Gulakov, Sergei V.; Nosovsky, Boris I.; Leschinsky, Leonid K.; Stepnov, Ksenofont K.; and Rudnev, Anatoly E. Method and apparatus for building up surface layer with alternating composition. 4,346,280, Cl. 219-76.100.
Gulf Research & Development Company: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,346,020, Cl. 252-429.00R.
Gulfko Incorporated: *See*—
Sullivan, James E., 4,346,149, Cl. 428-516.000.
Gundlach, Robert W., to Vencraft Corp. Snowmaking method and apparatus. 4,345,439, Cl. 62-71.000.
Gurol, I. Macit: *See*—
Chapel, Roy W., Jr.; and Gurol, I. Macit, 4,346,291, Cl. 250-211.00R.
Gurr, George P., to Sangamo Weston, Inc. Fault detector. 4,346,421, Cl. 361-57.000.
Gurr, George P., to Sangamo Weston, Inc. Rectifier controller responsive to sensed A.C. voltage signals. 4,346,432, Cl. 363-129.000.
Gustavsson, Lennart; and Maatta, Osten, to AB Svenska Flaktfabriken. Spray chamber including a wet separator. 4,345,921, Cl. 55-223.000.
Gutbier, Ernst A.; and Ouellette, Paul J., to Western Electric Company, Inc. Solder-bearing lead having solder flow-control stop means. 4,345,814, Cl. 339-275.00R.
Guth, Christian; Gysin, Hanspeter; and Binz, Jorg, to Ciba-Geigy Corporation. Process for dyeing or treating textile fibre materials. 4,345,909, Cl. 8-477.000.
Gutierrez, William S.; Gropper, Lee; and Brown, Hugh O., to Beckman Instruments, Inc. Safety lock for air driven centrifuge. 4,345,713, Cl. 233-1.00B.
Gutschmidt, Peter-Michel, to Orgatechna Treuhand AG. Installation for burning-out scrap metal. 4,345,530, Cl. 110-215.000.
Guzik, Chet. Vibrasonic fishing lure. 4,345,399, Cl. 43-42.060.
Gwynn, Eric C. E., to Singer Company, The. Wide angle display device. 4,345,817, Cl. 350-174.000.
Gysin, Hanspeter: *See*—
Guth, Christian; Gysin, Hanspeter; and Binz, Jorg, 4,345,909, Cl. 8-477.000.
H. Krantz GmbH & Co.: *See*—
Goldberg, Alan, 4,345,357, Cl. 26-18.500.
Hack, Joachim, to BASF Aktiengesellschaft. Magnetic head positioning servo arrangement for a system for recording/reproducing information on a magnetic recording medium, particularly on a flexible magnetic recording medium. 4,346,413, Cl. 360-77.000.
Hackett-Jones, Francis C. Method and means for controlling the flux density in the core of an inductor. 4,346,340, Cl. 323-249.000.
Hackler, Ronald E.: *See*—
Beck, James R.; Gajewski, Robert P.; and Hackler, Ronald E., 4,346,094, Cl. 424-270.000.
Hadley, Michael S.; King, Francis D.; and Martin, Roger T., to Beecham Group Limited. 1-Aza-4-oxa-bicyclo [4,4,0]decane derivatives. 4,346,089, Cl. 424-248.520.
Haefely, Willy: *See*—
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,030, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,031, Cl. 260-239.30T.
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Hagan, Joseph R.: *See*—
Hipchen, Donald E.; Skowronski, Michael J.; and Hagan, Joseph R., 4,346,133, Cl. 428-109.000.
Hagiwara, Yoshihide, to Japan Natural Food Co. Ltd. Soy sauce from tear grass and process for production thereof. 4,346,114, Cl. 426-18.000.
Hahn, A. David: *See*—
Curchack, Herbert D.; and Hahn, A. David, 4,345,460, Cl. 73-167.000.
Hailey, Laurence N.: *See*—
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,346,049, Cl. 264-65.000.
Haines, Richard M.: *See*—
Wong, Robert W.; and Haines, Richard M., 4,346,026, Cl. 524-157.000.
Hall, Charles P., to Monterey Manufacturing, Inc. Waterbed mattress with a baffle. 4,345,348, Cl. 5-450.000.
Hall, Henry K., Jr.; and Padias, Anne B., to Celanese Corporation. Process for the preparation of polybutylene terephthalate. 4,346,213, Cl. 528-272.000.
Hall, John B.: *See*—
Sprecker, Mark A.; and Hall, John B., 4,346,245, Cl. 568-665.000.
Hamanaka, Hiroyoshi; and Shinano, Mamoru, to Toho Chemical Industry Co., Ltd. Antibacterial surface active agent containing azaalkenelactam. 4,346,087, Cl. 424-244.000.
Hamaoka, Tsutomu: *See*—
Imatomi, Eiji; Ogawa, Tsuyoshi; and Hamaoka, Tsutomu, 4,346,167, Cl. 430-569.000.
Hamashima, Yoshio: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,346,218, Cl. 544-16.000.
Hammock, Michael T., to Lucas Industries Limited. Fuel pumping apparatus. 4,345,566, Cl. 123-502.000.
Handke, Gunther: *See*—
Wossner, Felix; Handke, Gunther; and Koller, Manfred, 4,345,748, Cl. 267-8.00R.
Handschuch, Karl; Wulfhorst, Burkhard; and Gilhaus, Konrad, to Schubert & Salzer. Mechanism for eliminating impurities from fibrous material, in particular cotton. 4,345,356, Cl. 19-200.000.
Hanna, George D., to Continental Electronics, Inc. Amplitude modulator using variable width rectangular pulse generator. 4,346,354, Cl. 332-43.00B.
Hannebaum, Harold W.: *See*—
Hannebaum, Tilda M.; and Hannebaum, Harold W., 4,345,972, Cl. 203-18.000.
Hannebaum, Tilda M.; and Hannebaum, Harold W. Alcohol recovery process. 4,345,972, Cl. 203-18.000.
Hannon, Gilbert H. Transmission utilizing velocity control mechanism. 4,345,491, Cl. 74-831.000.
Hansen, Borge M., to Danfoss A/S. Defroster for the evaporator of a refrigerator. 4,345,441, Cl. 62-140.000.
Hansen, James E., to Eaton Corporation. Electronic remote control D.C. power controller and circuit breaker. 4,346,424, Cl. 361-94.000.
Hansen, Kirsten: *See*—
Terrell, Ross C.; and Hansen, Kirsten, 4,346,246, Cl. 568-684.000.
Hanson, Steven P.; Smathers, Robert E.; and Morrison, Howard J., to Marvin Glass & Associates. Toy vehicle and launcher. 4,345,402, Cl. 46-206.000.
Hara, Yoshihumi; Kubota, Saburo; Ihara, Akira; Kishimoto, Masaru; and Suzuki, Masaki, to Matsushita Electric Industrial Company, Limited. Method and apparatus for digitally analyzing dynamic unbalance of a rotating body. 4,345,472, Cl. 73-462.000.
Harada, Kazuo: *See*—
Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, 4,346,010, Cl. 210-714.000.

Hardee, Kim C.: *See—*
Sud, Rahul; Hardee, Kim C.; and Heightley, John O., 4,346,459, Cl. 365-200.000.
Harradine, Ronald J.: *See—*
Rundell, John T.; Pottage, Paul R.; and Harradine, Ronald J., 4,345,947, Cl. 127-48.000.
Harrington Hoists: *See—*
Soussloff, Dimitri G., 4,345,851, Cl. 403-369.000.
Harris Corporation: *See—*
Davis, Robert C., 4,346,473, Cl. 371-43.000.
Erbstein, Robert S.; Richard, Gary R.; Palmatier, Roland T.; and McGill, Robert W., 4,346,446, Cl. 364-551.000.
Harrison, Michael R.: *See—*
Uba, Toshio; Ching, Larry K. W.; and Harrison, Michael R., 4,346,151, Cl. 429-54.000.
Hartman, Mondo L. Alternate firing method. 4,345,397, Cl. 42-42.00B.
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, to Aisin Seiki Kabushiki Kaisha; Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kogyo Kabushiki Kaisha. Sealing cup for hydraulic piston-cylinder device. 4,345,771, Cl. 277-205.000.
Hashimoto, Masanori: *See—*
Takahashi, Akira; and Hashimoto, Masanori, 4,345,826, Cl. 354-23.00D.
Hassman, Gregory V. Intrusion warning system utilizing a differential electric field. 4,346,373, Cl. 340-561.000.
Hastings Manufacturing Co.: *See—*
Alexander, Willis R.; and Shaltis, Robert J., 4,346,009, Cl. 210-512.100.
Hatch, David A., to Pintek, Inc. Keyable connector-header assemblies for multiple conductor cables. 4,345,813, Cl. 339-184.00M.
Hattori, Mitsuhiro: *See—*
Nakayama, Shozo; Hattori, Mitsuhiro; and Ono, Hiromitsu, 4,345,886, Cl. 418-100.000.
Hattori, Tadashi; Mukainakano, Siniti; and Yoshida, Hitoshi, to Nippon Soken, Inc. Intake system for internal combustion engines. 4,345,569, Cl. 123-549.000.
Hattori, Tadashi: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,345,558, Cl. 123-425.000.
Hauner, Friedrich, to Schubert & Salzer. Apparatus for paraffining yarn. 4,345,542, Cl. 118-78.000.
Hauser, Kurt, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Motor vehicle, especially a truck, with a cooling device for an internal combustion engine. 4,345,641, Cl. 165-41.000.
Hawkins, Lyle B.: *See—*
Derr, Leighton K.; Hawkins, Lyle B.; and Jones, Marlene J., 4,346,229, Cl. 560-91.000.
Hayakawa, Shun-ichi: *See—*
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,346,046, Cl. 260-458.00C.
Hayashi, Masaki: *See—*
Tanouchi, Tadao; Kawamura, Masanori; Okada, Takanori; and Hayashi, Masaki, 4,346,099, Cl. 424-273.00R.
Hayes, Cecil L.: *See—*
Dawson, Stanley R.; and Hayes, Cecil L., 4,345,643, Cl. 165-122.000.
Hayes, Stanley B., Jr., to EG&G, Inc. Dew point hygrometer with continuous balancing system. 4,345,455, Cl. 374-20.000.
Haynes, Ronald L.: *See—*
Crano, John C.; and Haynes, Ronald L., 4,346,197, Cl. 525-277.000.
Hayward, Robert D. Cable tool. 4,345,375, Cl. 30-90.100.
Heberlein, Gustave E., Jr.: *See—*
Kussy, Frank W.; Heberlein, Gustave E., Jr.; and DiMarco, Bernard, 4,346,357, Cl. 335-16.000.
Hecht, Ralph J., to United Technologies Corporation. High temperature fatigue oxidation resistant coating on superalloy substrate. 4,346,137, Cl. 428-215.000.
Heck, Peter J. Work station desk. 4,345,803, Cl. 312-194.000.
Hedgren, Erland, to Salve S.A. Mound dressing. 4,345,591, Cl. 128-169.000.
Heft, Eldon B., to General Electric Company. Contact pop responsive latch release for circuit breakers. 4,346,358, Cl. 335-16.000.
Heightley, John O.: *See—*
Sud, Rahul; Hardee, Kim C.; and Heightley, John O., 4,346,459, Cl. 365-200.000.
Heimann, Sigismund: *See—*
Vescia, Michele; and Heimann, Sigismund, 4,345,910, Cl. 8-610.000.
Hellwig, Donald J., to Hellwig Products Company, Inc. Multipurpose splint means for spring leaf assemblies. 4,345,749, Cl. 267-51.000.
Hellwig Products Company, Inc.: *See—*
Hellwig, Donald J., 4,345,749, Cl. 267-51.000.
Hemmi, Peter; and Schrepfer, Richard, to Netstal-Maschinen AG. Injection molding machine having mold locking unit equipped with toggle drive and hydraulic locking mechanism. 4,345,890, Cl. 425-143.000.
Hengel, Jean V. Simplified phonics in the sequential steps to reading. 4,345,902, Cl. 434-170.000.
Henkel, James G.; and Gianutsos, Gerald, to University Patents Inc. Composition and method for treating patients having Parkinson's Disease. 4,346,112, Cl. 424-325.000.
Henkensiefken, Larry L.: *See—*
Schwalenberg, Terry R.; Krumholz, Frank C.; Kanengieter, Glenn G.; and Henkensiefken, Larry L., 4,345,421, Cl. 56-341.000.
Henningsson, Thom L., to Ingenjorsfirma T. Henningsson AB. Control and cut-off device for flowing media. 4,345,622, Cl. 137-637.100.
Henrion, Romain: *See—*
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; Lorang, Lucien; and Baumert, Jean, 4,345,746, Cl. 266-90.000.
Hepworth, Edward C.: *See—*
Kyu, Shikun; and Hepworth, Edward C., 4,346,440, Cl. 364-200.000.
Hercules Incorporated: *See—*
Davis, James W., 4,345,405, Cl. 47-10.000.
Derr, Leighton K.; Hawkins, Lyle B.; and Jones, Marlene J., 4,346,229, Cl. 560-91.000.
Hermann Berstorff Maschinenbau GmbH: *See—*
Koch, Klaus, 4,345,988, Cl. 208-8.00R.
Hermes, Rudolf, to Osborn Manufacturing Corporation, The. Foundry molding method. 4,345,638, Cl. 164-456.000.
Herter, Johanna, heiress: *See—*
Herter, Martin, deceased; Herter, Johanna, heiress; Radtke, Ingrid, heir; Herter, Manfred, heir; and Oppel, Werner, 4,345,610, Cl. 137-7.000.
Herter, Manfred, heir: *See—*
Herter, Martin, deceased; Herter, Johanna, heiress; Radtke, Ingrid, heir; Herter, Manfred, heir; and Oppel, Werner, 4,345,610, Cl. 137-7.000.
Herter, Martin, deceased; by Herter, Johanna, heiress; by Radtke, Ingrid, heir; by Herter, Manfred, heir; and Oppel, Werner. Process and device for the mixing of gases. 4,345,610, Cl. 137-7.000.
Hertz, Carl H. Method and apparatus for controlling the electric charge on droplets and ink-jet recorder incorporating the same. 4,346,387, Cl. 346-1.100.
Hertzenberg, Elliot P.: *See—*
Dent, Anthony L.; Derolf, M. Robert; and Hertzenberg, Elliot P., 4,346,071, Cl. 424-49.000.
Herweh, John E.: *See—*
Garrett, Thomas B.; Herweh, John E.; Magnusson, Alan B.; and Miller, Normal L., 4,346,186, Cl. 524-82.000.
Herz, Arthur H.: *See—*
McLaen, Donald F.; and Herz, Arthur H., 4,346,154, Cl. 430-14.000.
Herzl, Peter J.; Metzger, Harold W.; and Crumley, Richard L., to Fischer & Porter Company. Centering device for flowmeters interposed in flow line. 4,345,464, Cl. 73-201.000.
Herzog, Eugene: *See—*
Royer, Alain L. A.; Herzog, Eugene; and Rouyer, Robert M. L., 4,345,952, Cl. 148-3.000.
Hessler, Edward J.: *See—*
Burke, Howard J.; and Hessler, Edward J., 4,346,037, Cl. 260-239.55R.
Hesston Corporation: *See—*
Anderson, Carl M.; and Losey, Vernon L., 4,345,870, Cl. 414-686.000.
Hestad, Alfred M.; and Rose, Levi L., to United Networks, Inc. Speaker phones. 4,346,261, Cl. 179-1.0HF.
Hewes, Francis W., Jr. Dehorning tool. 4,345,377, Cl. 30-181.000.
Hewlett-Packard Company: *See—*
Murphy, Andrew J.; Rhodes, Robert P.; and Woodruff, Terry A., 4,346,055, Cl. 422-54.000.
Severson, Eugene K., 4,346,308, Cl. 307-252.00B.
Hewlett-Packard GmbH: *See—*
Aue, Peter; and Huttemann, Werner, 4,346,311, Cl. 307-268.000.
Heymer, Gero: *See—*
Maurer, Alexander; Adrian, Renate; and Heymer, Gero, 4,346,065, Cl. 423-305.000.
Hibino, Kunio: *See—*
Takeyama, Kenichi; Morimoto, Takayoshi; and Hibino, Kunio, 4,346,163, Cl. 430-280.000.
Higashi, Haruki: *See—*
Iida, Koso; Shiraishi, Hideo; and Higashi, Haruki, 4,345,432, Cl. 60-290.000.
Hildreth, Donald M.; and Tyler, Edward P. Vehicle engine remote starter control and protective system. 4,345,554, Cl. 123-179.0BG.
Hiles, Maurice A. F., to National Research Development Corporation. Energy absorbing elastomers and composites. 4,346,205, Cl. 528-53.000.
Hillenbrand, Louis J.; Preston, Joseph R.; and Berry, David A., to RCA Corporation. High density information disc. 4,346,469, Cl. 369-276.000.
Hillenbrand, Louis J.: *See—*
Preston, Joseph R.; Hillenbrand, Louis J.; and Berry, David A., 4,346,468, Cl. 369-276.000.
Hiltebrandt, Siegfried, to Richard Wolf GmbH. Endoscopic instrumentation apparatus. 4,345,589, Cl. 128-4.000.
Hilton, R. John, to Boeing Company, The. Honeycomb core assembly including a sacrificial core portion. 4,346,134, Cl. 428-116.000.
Hinckley, Conrad C., to Research Corporation. Osmium carbohydrate complexes. 4,346,216, Cl. 536-121.000.
Hipchen, Donald E.; Skowronski, Michael J.; and Hagan, Joseph R., to Celotex Corporation, The. Structural laminate and method for making same. 4,346,133, Cl. 428-109.000.
Hirai, Katsumi: *See—*
Kamata, Shohichi; Kimura, Yoshinori; and Hirai, Katsumi, 4,346,347, Cl. 324-158.00D.
Hiraishi, Hisashi; Morichika, Toshiaki; and Murakami, Shinichi, to Kubota Ltd. Non-pick-up and heat resistant alloy. 4,345,941, Cl. 75-122.000.
Hirasawa, Kazuo; and Kubo, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Optical apparatus for tracking a record carrier. 4,346,471, Cl. 369-44.000.

Hirschfeld, Tomas, to Technicon Instruments Corporation. Infrared radiation lamp. 4,346,323, Cl. 313-111.000.

Hisajima, Masahiko: *See—*
Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, 4,345,834, Cl. 355-3.00R.

Hitachi Chemical Company, Ltd.: *See—*
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,346,206, Cl. 528-88.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Huno, Takakazu; Endo, Takeyuki; Odaka, Kunihiro; and Shibuya, Yasutaka, 4,346,439, Cl. 364-200.000.

Hitachi, Ltd.: *See—*
Endo, Fumihiro; Ishikawa, Toshio; Ozawa, Jun; Kamata, Yuzuru; and Shiono, Shigeo, 4,345,471, Cl. 374-188.000.
Huno, Takakazu; Endo, Takeyuki; Odaka, Kunihiro; and Shibuya, Yasutaka, 4,346,439, Cl. 364-200.000.
Kakuta, Atsushi; Suzuki, Shigeo; Mori, Yasuki; and Morishita, Hirosada, 4,346,157, Cl. 430-58.000.
Kaneko, Takashi; and Iwasaka, Tatsuo, 4,345,670, Cl. 187-29.00R.
Morinaga, Shigeki, 4,346,434, Cl. 364-183.000.
Ohkoshi, Seiei; Ishikawa, Isao; Okamoto, Teiji; and Tsukamoto, Nobuo, 4,346,472, Cl. 371-37.000.
Ouchi, Hirobumi, 4,346,395, Cl. 357-30.000.
Yoda, Haruo; and Motoike, Jun, 4,346,405, Cl. 358-105.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, 4,346,010, Cl. 210-714.000.

Hjellum, Jerry: *See—*
Moss, Theron C.; Boring, Earl; and Hjellum, Jerry, 4,345,351, Cl. 15-144.00B.

Hoagland, Jesse. Adjustable dumbbell apparatus. 4,345,756, Cl. 272-117.000.

Hoechst Aktiengesellschaft: *See—*
Gradl, Reinhard; Schrodter, Klaus; Ehlers, Klaus-Peter; and Scheibitz, Wolfgang, 4,346,066, Cl. 423-321.00S.
Lang, Hans-Jochen; Seuring, Bernhard; and Granzer, Ernold, 4,346,088, Cl. 424-248.510.
Maurer, Alexander; Adrian, Renate; and Heymer, Gero, 4,346,065, Cl. 423-305.000.
Meyer, Klaus, 4,345,931, Cl. 71-28.000.

Hof, Craig R.; Ulin, Roy A., Jr.; and Polak, Robert B., to Akzona Incorporated. All plastic disposable thermometer. 4,345,470, Cl. 374-106.000.

Hofer, Norbert: *See—*
Faust, Uwe; Prave, Paul; Dorsemagen, Beate; and Hofer, Norbert, 4,346,113, Cl. 426-12.000.

Hoffmann, Gerhart; Cordes, Rudolph; and Merkel, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of dimethyl terephthalate. 4,346,230, Cl. 560-99.000.

Hoffmann-La Roche Inc.: *See—*
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,030, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,031, Cl. 260-239.30T.
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Hofmann, Heinrich; Markfelder, Gunther; and Bender, Hans-Eberhard, to Fag Kugelfischer Georg Schafer & Co. Double-row radially self-aligning roller bearing. 4,345,800, Cl. 308-217.000.

Hoge, Henri H., to Enertron, Inc. Feedback control system for applying AC power to ballasted lamps. 4,346,331, Cl. 315-158.000.

Hoh, George L.; and Vassallo, Donald A., to Du Pont de Nemours, E. I., and Company. Heat seal composition comprising a blend of metal neutralized polymers. 4,346,196, Cl. 525-196.000.

Holahan, Edward T.: *See—*
Katzman, Allison W.; Holahan, Edward T.; Zaruba, John V.; and Morrison, Howard J., 4,345,400, Cl. 46-4.000.

Holland, Bruce B. Coded strobe light device for aircraft. 4,346,430, Cl. 362-62.000.

Holland Company: *See—*
Chierici, Osvaldo F., 4,345,689, Cl. 213-61.000.

Hollister, Kenneth R.: *See—*
Ponticello, Ignazio S.; Hollister, Kenneth R.; and Tuites, Richard C., 4,346,231, Cl. 560-178.000.

Holt, David, to Pifco Limited. Electric toaster. 4,345,513, Cl. 99-327.000.

Holt, David, to Pifco Limited. Slidable brush and screw linear drive arrangement. 4,345,515, Cl. 99-393.000.

Holtz, Leonard. Head support. 4,345,345, Cl. 5-437.000.

Holtz, Leonard. Head support. 4,345,346, Cl. 5-437.000.

Holzhauser, Ronald C., to Eastman Kodak Company. Sheet feeding apparatus. 4,345,751, Cl. 271-3.100.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Anno, Nobuo; Okui, Haruki; Yamamoto, Kuniyuki; and Miyazaki, Kunio, 4,345,664, Cl. 180-230.000.
Minagawa, Masaaki, 4,345,778, Cl. 280-701.000.
Nishikawa, Masao, 4,345,661, Cl. 180-141.000.

Honeywell Inc.: *See—*
Johnson, Russell L., 4,345,477, Cl. 73-766.000.

Honeywell Information Systems Inc.: *See—*
Plank, Odas P.; Slater, Richard A.; and Taibbi, Steven G., 4,346,441, Cl. 364-200.000.

Hopley, Eric T., to U.G. Closures & Plastics Limited. Safety closure. 4,345,690, Cl. 215-216.000.

Horkey, Edward J. Chain driven conveyor belts. 4,345,685, Cl. 198-852.000.

Hornbaker, Edwin D.; and Jones, Jesse D., to Ethyl Corporation. Polyethylene terephthalate blends. 4,346,195, Cl. 525-176.000.

Horvath, Gyula: *See—*
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.

Horvath, William. Manually actuated trigger sprayer. 4,345,718, Cl. 239-333.000.

Hosogai, Setsuo: *See—*
Fujiwara, Kohei; and Hosogai, Setsuo, 4,346,356, Cl. 335-6.000.

Hostetler, John L.: *See—*
Decker, Charles E.; and Hostetler, John L., 4,346,129, Cl. 427-348.000.

Houseman, Andrew J.: *See—*
McCranie, Stephen C.; and Houseman, Andrew J., 4,345,413, Cl. 53-315.000.

Houston, David T.: *See—*
Allen, Charles A.; and Houston, David T., 4,346,390, Cl. 346-76.0PH.

Hovens, Paulus J. M., to U.S. Philips Corporation. Matrix circuits. 4,346,400, Cl. 358-30.000.

Howard, Kenneth J.: *See—*
Deavenport, Dennis L.; Howard, Kenneth J.; and Sidwell, Albert E., 4,346,248, Cl. 568-776.000.

Howard, Mig A., to Hughes Tool Company. Electronic depth indicator for hydraulic drilling machines. 4,345,657, Cl. 175-40.000.

Howard, William M.: *See—*
Monticelli, Dennis M.; Howard, William M.; and Sleeth, Robert S., 4,346,380, Cl. 340-825.630.

Hu, Hung L.; and Ju, Kochan, to International Business Machines Corporation. Dovetail propagation structure for contiguous disk bubble devices. 4,346,457, Cl. 365-36.000.

Huang, Chiung-Yuan: *See—*
Riegel, Herbert; and Huang, Chiung-Yuan, 4,346,069, Cl. 423-488.000.

Hubbard, Leo J., to P.H.D. of Puerto Rico, Inc. Document feed mechanism. 4,345,708, Cl. 226-74.000.

Hubbard, Martin G.; and Erickson, John W., to Kobe, Inc. Conduit in supplying electrical power and pressurized fluid to a point in a subterranean well. 4,346,256, Cl. 174-47.000.

Huchette, Michel: *See—*
Verwaerde, Francoise; Leleu, Jean-Bernard; and Huchette, Michel, 4,346,116, Cl. 426-48.000.

Huddleston, Bruce C.: *See—*
Weber, Roy; and Huddleston, Bruce C., 4,345,529, Cl. 110-213.000.

Hudson Products Corporation: *See—*
Monroe, Robert C., 4,345,877, Cl. 416-239.000.

Hughes Aircraft Company: *See—*
Figueroa, Luis; and Yen, Huan-Wun, 4,346,394, Cl. 357-30.000.
Neufeld, Murray J., 4,345,728, Cl. 244-168.000.
Robinson, William P.; and Seliger, Robert L., 4,346,301, Cl. 250-492.200.

Hughes Tool Company: *See—*
Baugh, John L.; and Montgomery, James W., 4,345,649, Cl. 166-120.000.
Howard, Mig A., 4,345,657, Cl. 175-40.000.
Regan, John, 4,345,735, Cl. 251-1.00B.

Humber, Leslie G.; Bruderlein, Francois T.; and Asselin, Andre A., to Ayerst, McKenna & Harrison Ltd. 13-Chloro-benzocycloheptapyridoisoquinolines and use as neuroleptics. 4,346,090, Cl. 424-258.000.

Humphries, Donald N.: *See—*
Wood, Laurier A.; and Humphries, Donald N., 4,346,124, Cl. 427-82.000.

Hunkeler, Walter: *See—*
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,030, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,031, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,032, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,033, Cl. 260-239.30B.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,034, Cl. 260-239.30T.

Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,035, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,036, Cl. 260-239.30T.

Huno, Takakazu; Endo, Takeyuki; Odaka, Kunihiro; and Shibuya, Yasutaka, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Direct memory access of a main memory by an input/output device using a table in main memory. 4,346,439, Cl. 364-200.000.

Hussmann, Peter, to Mittex Aktiengesellschaft. Method and apparatus for recovery of water from the atmosphere. 4,345,917, Cl. 55-33.000.

Hutchinson, Bruce R.: *See—*
Smith, Willard P.; and Hutchinson, Bruce R., 4,345,894, Cl. 431-170.000.

Hutson, Coy R.: *See—*
Wilson, Billy E.; and Hutson, Coy R., 4,345,697, Cl. 220-335.000.

Huttemann, Werner: *See—*
Aue, Peter; and Huttemann, Werner, 4,346,311, Cl. 307-268.000.

Hyde, Thomas J., to Du Pon² de Nemours, E. I., and Company. Methacrylate polymer mix containing alkaline earth metal resinate. 4,346,183, Cl. 523-200.000.

I.H.W. Engineering Limited: *See—*
Shephard, Philip C., 4,345,792, Cl. 297-362.000.

Ichikawa, Hiroki, to Olympus Optical Co., Ltd. Hinge mechanism. 4,345,354, Cl. 16-257.000.

Ichikawa, Iwao: *See—*
Ohsawa, Mitsuo; Noda, Yoshiteru; Ichikawa, Iwao; and Yamamoto, Katsumi, 4,345,371, Cl. 29-836.000.

Ida, Edward S., to Du Pont de Nemours, E. I., and Company. Alarm circuit. 4,346,371, Cl. 340-507.000.

Ihara, Akira: *See—*
Hara, Yoshihumi; Kubota, Saburo; Ihara, Akira; Kishimoto, Masaru; and Suzuki, Masaki, 4,345,472, Cl. 73-462.000.

IHC Holland N.V.: *See—*
de Keizer, Cornelis, 4,345,388, Cl. 37-195.000.

Iida, Koso; Shiraishi, Hideo; and Higashi, Haruki, to Toyo Kogyo Co., Ltd. Exhaust gas purifying system for internal combustion engine. 4,345,432, Cl. 60-290.000.

Iiyama, Shigeru; Otsu, Sinzi; and Ooyachi, Akio. Automatic tape applicator. 4,345,966, Cl. 156-523.000.

Iizuka, Haruhiko; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Internal combustion engine. 4,345,571, Cl. 123-568.000.

Ikawa, Tsuneo; and Yamase, Toshihiro, to Tokyo Institute of Technology. Process for the production of hydrogen utilizing a photogalvanic effect of a polyacid ion. 4,345,982, Cl. 204-129.000.

Ikeda, Hironosuke; Oishi, Hisao; and Yoshida, Seiki, to Sanyo Electric Co., Ltd. Safety valve means for battery. 4,345,611, Cl. 137-68.00R.

Ikeda, Shigeho: *See—*
Akashi, Kunihiko; Nakamura, Yayoi; Tsuchida, Takayasu; Yoshii, Hiroe; and Ikeda, Shigeho, 4,346,169, Cl. 435-114.000.

Ikeda, Toshiaki: *See—*
Suzuki, Masakazu; Furuichi, Shuhei; and Ikeda, Toshiaki, 4,346,297, Cl. 378-110.000.

Ikeura, Kenji, to Nissan Motor Company, Limited. Idle speed control method and system for an internal combustion engine of an automobile vehicle. 4,345,557, Cl. 123-339.000.

Ikezawa, Toshi: *See—*
Yamasawa, Masao; Ohhata, Michinobu; and Ikezawa, Toshi, 4,346,476, Cl. 375-8.000.

Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, to Toyo Jozo Kabushiki Kaisha. Process for the production of acyl-Coenzyme A oxidase. 4,346,173, Cl. 435-189.000.

Imamura, Shigeyuki: *See—*
Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, 4,346,173, Cl. 435-189.000.

Imatomi, Eiji; Ogawa, Tsuyoshi; and Hamaoka, Tsutomu, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material and process for producing silver halide photographic emulsion. 4,346,167, Cl. 430-569.000.

Imperial Chemical Industries Limited: *See—*
Bornat, Alan; and Clarke, Roy M., 4,345,414, Cl. 53-425.000.
Smith, Leslie H., 4,346,111, Cl. 424-324.000.

Inai, Yuichi: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.

Ingenjorsfirma T. Henningsson AB: *See—*
Henningsson, Thom L., 4,345,622, Cl. 137-637.100.

Ingham, Francis H., to International Telephone and Telegraph Corporation. Electrical connector. 4,345,808, Cl. 339-40.000.

Inglett & Company, Inc.: *See—*
Inglett, Wilfred L., Jr., 4,345,629, Cl. 141-114.000.

Inglett, Wilfred L., Jr., to Inglett & Company, Inc. Automatic bag hanger. 4,345,629, Cl. 141-114.000.

Ingram, Charles E. Stopped vehicle warning device. 4,346,365, Cl. 340-72.000.

INMOS Corporation: *See—*
Sud, Rahul; Hardee, Kim C.; and Heightley, John O., 4,346,459, Cl. 365-200.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,346,281, Cl. 219-76.130.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for discharge-surfacing electrically conductive workpieces. 4,346,281, Cl. 219-76.130.

Inoue, Naohiko: *See—*
Miyamoto, Keiichi; Inoue, Naohiko; and Takeuchi, Yasuhisa, 4,345,522, Cl. 104-89.000.

Inoue, Toyokazu, to Brother Kogyo Kabushiki Kaisha. DC Servomotor system. 4,346,334, Cl. 318-45.000.

Inryco, Inc.: *See—*
Schroeder, Donald E.; and Temperly, Thomas, 4,345,409, Cl. 52-693.000.

Insam, Howard F.; and Laurenson, Stephen R., to General Electric Company, Limited, The. Generation of electric signals having approximately sinusoidal wavefor ns. 4,346,448, Cl. 364-607.000.

Institut Francais du Petrole: *See—*
du Boullay, Benoit T., 4,346,462, Cl. 367-61.000.
Roque, Claude, 4,345,652, Cl. 166-307.000.
Sugier, Andre; Freund, Edouard; and Le Page, Jean-Francois, 4,346,179, Cl. 518-707.000.

Institute of Critical Care Medicine: *See—*
Bisera, Jose; and Weil, Max H., 4,345,594, Cl. 128-214.00F.

Institute of Gas Technology: *See—*
Meissner, Herman P., 4,345,918, Cl. 55-38.000.
Sammells, Anthony F.; and St. John, Michael R., 4,346,152, Cl. 429-112.000.

Institute Za Yadreni Izsledvaniya I Yadrena Energetika: *See—*
Nedyalkov, Ivan P., 4,345,434, Cl. 60-398.000.

Institutul de Cercetari Pentru Industria Electrotehnica: *See—*
Arabadji, Petre, 4,346,306, Cl. 307-108.000.

Instruments, Computers and Controls Corp.: *See—*
Schroyer, Kenneth, 4,345,481, Cl. 73-862.340.

International Business Machines Corporation: *See—*
Alvarez, Joseph A., III; and Shabe, John, 4,346,470, Cl. 370-104.000.
Berger, Horst H.; and Wiedmann, Siegfried K., 4,346,458, Cl. 365-174.000.
Berndlmaier, Erich; Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., 4,346,343, Cl. 323-282.000.
Bohnhoff, Alan E.; Cassidy, Bruce M.; and Dyer, Stanley, 4,345,845, Cl. 400-120.000.
Buhler, Otto R.; Gardner, Homer J.; and Marino, Peter T., 4,346,411, Cl. 360-46.000.
Christopherson, Warren A., 4,346,312, Cl. 307-270.000.
Hu, Hung L.; and Ju, Kochan, 4,346,457, Cl. 365-36.000.
Mathews, Raymond D., 4,345,846, Cl. 400-157.000.
Pipkin, David J., 4,345,543, Cl. 118-106.000.
Routt, Wilson M., Jr.; and West, Donald L., 4,346,292, Cl. 250-216.000.
Sze, Daniel T. W., 4,346,474, Cl. 371-49.000.

International Flavors & Fragrances Inc.: *See—*
Boden, Richard M., 4,346,237, Cl. 568-398.000.
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,346,080, Cl. 424-84.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,346,243, Cl. 568-591.000.
Sprecker, Mark A.; and Hall, John B., 4,346,245, Cl. 568-665.000.

International Harvester Company: *See—*
Gagliani, John; and Lee, Raymond, 4,346,182, Cl. 521-189.000.
McHenney, John R., 4,345,806, Cl. 339-19.000.
Vacval, Dusan M., 4,345,674, Cl. 188-71.800.

International Minerals & Chemical Corp.: *See—*
Robinson, Glenn N., 4,345,945, Cl. 106-300.000.

International Standard Electric Corporation: *See—*
Bosc, Henri J.; and Goyard, Pierre J., 4,346,382, Cl. 343-5.0SA.
Drake, Cyril F., 4,346,184, Cl. 523-451.000.

International Telephone and Telegraph Corporation: *See—*
Ingham, Francis H., 4,345,808, Cl. 339-40.000.
Lacaze, Leonard, Jr., 4,345,373, Cl. 29-874.000.
Ponzi, Joseph J., 4,345,456, Cl. 73-32.00A.

InterNorth, Inc.: *See—*
Mills, Walter C.; and Patterson, James W., 4,345,613, Cl. 137-317.000.

Interox (Societe Anonyme): *See—*
Gago, Ignace; and Coppens, Guillaume, 4,346,081, Cl. 424-130.000.

Inzoli, Luciano, to Italtel Societa Italiana Telecomunicazioni S.p.A. Power-distribution network for telecommunication system. 4,346,422, Cl. 361-62.000.

Iowa State University Research Foundation, Inc.: *See—*
Kraus, George A., 4,346,039, Cl. 549-289.000.

Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Method of and apparatus for processing a radiographic image. 4,346,409, Cl. 358-280.000.

Ishida, Masamitsu: *See—*
Kato, Hisatoyo; and Ishida, Masamitsu, 4,346,406, Cl. 358-110.000.

Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,345,385, Cl. 34-23.000.

Ishikawa, Hidehiko: *See—*
Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, 4,346,173, Cl. 435-189.000.

Ishikawa, Isao: *See—*
Ohkoshi, Seiei; Ishikawa, Isao; Okamoto, Teiji; and Tsukamoto, Nobuo, 4,346,472, Cl. 371-37.000.

Ishikawa, Toshio: *See—*
Endo, Fumihiro; Ishikawa, Toshio; Ozawa, Jun; Kamata, Yuzuru; and Shiono, Shigeo, 4,345,471, Cl. 374-188.000.
Ishikawa, Yoshihisa: *See—*
Sadamatsu, Shigeru; Pu, Lyon S.; and Ishikawa, Yoshihisa, 4,346,159, Cl. 430-67.000.
Islam, Mir N., to University of Delaware. Antimicrobial agents added to animal feeds. 4,346,118, Cl. 426-335.000.
Isobe, Taketo; and Matsushita, Terumi, to Mutoh Industry Ltd. Plotting head for use in drawing machine. 4,346,392, Cl. 346-139.00C.
Isover Saint-Gobain: *See—*
Lanneau, Jacques; and Delcoigne, Adrien, 4,345,887, Cl. 425-115.000.
Italtel Societa Italiana Telecomunicazioni S.p.A.: *See—*
Inzoli, Luciano, 4,346,422, Cl. 361-62.000.
Ito, Tadashi: *See—*
Shinbori, Kenichi; Sakai, Shinji; Shinoda, Nobuhiko; Ito, Tadashi; and Murakami, Hiroyasu, 4,345,829, Cl. 354-37.000.
Umaba, Toshihiko; and Ito, Tadashi, 4,346,012, Cl. 252-7.000.
Itoh, Katsumi: *See—*
Nakamoto, Takeshi; Iwaki, Katsutaro; Muto, Katsuya; Itoh, Katsumi; and Akita, Yoshio, 4,346,338, Cl. 322-28.000.
Itoh, Yutaka: *See—*
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,346,206, Cl. 528-88.000.
ITT Industries, Inc.: *See—*
Blossfeld, Lothar, 4,346,313, Cl. 307-350.000.
Mutschler, Erich; and Weber, Adam, 4,346,274, Cl. 200-296.000.
Ivanenko, Oleg V.: *See—*
Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.
Iwaki, Katsutaro: *See—*
Nakamoto, Takeshi; Iwaki, Katsutaro; Muto, Katsuya; Itoh, Katsumi; and Akita, Yoshio, 4,346,338, Cl. 322-28.000.
Iwakiri, Norio; and Kiyono, Yasuhiro, to Omron Tateisi Electronics Co. Illuminated pushbutton switch. 4,346,275, Cl. 200-314.000.
Iwakura, Ryoji: *See—*
Morokawa, Shigeru; and Iwakura, Ryoji, 4,346,350, Cl. 331-116.0FE.
Iwami, Tadakatsu. Secondary air feeder for an internal combustion engine. 4,345,574, Cl. 123-587.000.
Iwasaka, Tatsuo: *See—*
Kaneko, Takashi; and Iwasaka, Tatsuo, 4,345,670, Cl. 187-29.00R.
Iwasawa, Yoshiyuki: *See—*
Suzuki, Yoshinobu; Chiba, Kiyoshi; Tukuhiro, Tomoya; Iwasawa, Yoshiyuki; Kajioka, Yasuo; and Komine, Tomio, 4,345,431, Cl. 60-286.000.
J. M. Voith GmbH: *See—*
Kuhn, Friedrich, 4,345,722, Cl. 242-56.00R.
J. P. Stevens & Co., Inc.: *See—*
Chambers, George S., 4,345,694, Cl. 220-86.0AT.
Jackson, William A., to Jogler, Inc. Liquid sight monitor. 4,345,468, Cl. 73-326.000.
Jacobson, Chester F., to Gillette Company, The. Razor with means to adjust blade geometry. 4,345,374, Cl. 30-47.000.
Jadlocki, Joseph F., Jr.: *See—*
Thompson, John S.; and Jadlocki, Joseph F., Jr., 4,346,117, Cl. 426-264.000.
Jager, Joseph E. Stack starter. 4,345,865, Cl. 414-35.000.
"Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft: *See—*
Pracht, Gunther, 4,345,378, Cl. 30-266.000.
Jahnke, Richard W., to Lubrizol Corporation, The. Phosphorus-containing compositions, lubricants containing them and metal workpieces coated with same. 4,346,148, Cl. 428-461.000.
Jahns, Edward R., to CBS Inc. Musical instrument performance amplifier. 4,345,502, Cl. 84-1.210.
James, Kristi L.; and Shields, A. L., to Motorola, Inc. Metal etch solution and method. 4,345,969, Cl. 156-659.100.
Janniello, Frank, to Clairol Incorporated. Detachable plug. 4,346,419, Cl. 361-2.000.
Janome Sewing Machine Co. Ltd.: *See—*
Eguchi, Yasukata, 4,345,532, Cl. 112-158.00E.
Janssen, Alexander P. Visible indexes. 4,345,396, Cl. 40-490.000.
Janssen, Leonard J. J.: *See—*
de Groot, Hans; van den Heuvel, Eeuwoud; Barendrecht, Embrecht; and Janssen, Leonard J. J., 4,345,978, Cl. 204-74.000.
Japan Natural Food Co. Ltd.: *See—*
Hagiwara, Yoshihide, 4,346,114, Cl. 426-18.000.
Jarman, Alonzo B.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,345,736, Cl. 251-30.000.
Jarund, Erik, to Tetra Pak International AB. Method for the manufacture of packages for drinking straws. 4,345,415, Cl. 53-450.000.
Jarvis, Roger P., to Automotive Products Limited. Friction clutch driven plates. 4,345,676, Cl. 192-107.00C.
Jelinek, Jan: *See—*
Zobac, Ladislav; Malek, Zdenek; Soukup, Frantisek; Ryska, Antonin; Jelinek, Jan; and Busta, Jiri, 4,345,598, Cl. 128-303.100.
Jetform Heisskanalnormalien und Zubehor GmbH, Firma: *See—*
Schulte, Wolfgang; and Castiglia, Giacinto, 4,345,892, Cl. 425-548.000.
JH Industries, Inc.: *See—*
Johnson, Dwight N., 4,345,619, Cl. 137-512.150.
Jogler, Inc.: *See—*
Jackson, William A., 4,345,468, Cl. 73-326.000.
John Fluke Mfg. Co., Inc.: *See—*
Chapel, Roy W., Jr.; and Gurol, I. Macit, 4,346,291, Cl. 250-211.00R.
Johnson, Bruce K., to Polaroid Corporation. Light detecting apparatus for photographic camera. 4,345,828, Cl. 354-27.000.
Johnson, Dwight N., to JH Industries, Inc. Backflow preventer. 4,345,619, Cl. 137-512.150.
Johnson, E. Marshall, to Thomas Jefferson University. Test for teratogenic potential employing hydra. 4,346,070, Cl. 424-9.000.
Johnson, Howard L., to Caterpillar Tractor Co. Control for load sharing pumps. 4,345,436, Cl. 60-421.000.
Johnson & Johnson Baby Product Company: *See—*
Tritsch, Ludwig, 4,345,597, Cl. 128-287.000.
Johnson, Russell L., to Honeywell Inc. Semiconduction stress sensing apparatus. 4,345,477, Cl. 73-766.000.
Johnson, Walter J., to Boeing Company, The. Digital-to-analog converter capable of processing a sign magnitude or ones complement binary coded input. 4,346,368, Cl. 340-347.0DA.
Johnston, Paul R., to Washington Rotating Control Heads, Inc. Drilling head assembly seal. 4,345,769, Cl. 277-31.000.
Jones, Cameron W.: *See—*
Alonso, Sydney A.; and Jones, Cameron W., 4,345,500, Cl. 84-1.010.
Jones, Jesse D.: *See—*
Hornbaker, Edwin D.; and Jones, Jesse D., 4,346,195, Cl. 525-176.000.
Jones & Laughlin Steel Incorporated: *See—*
Koros, Peter J., 4,345,940, Cl. 75-58.000.
Jones, Marlene J.: *See—*
Derr, Leighton K.; Hawkins, Lyle B.; and Jones, Marlene J., 4,346,229, Cl. 560-91.000.
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Mohr, Sigo, Jr.; and Carter, Jerry L., 4,345,908, Cl. 8-111.000.
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Burdeska, Kurt; and Kabas, Guglielmo, 4,346,016, Cl. 252-301.220.
Kabel und Metallwerke Gutehoffnungshutte AG: *See—*
Leuchs, Ottmar; Kloppner, Hans-Jurgen; and Uhlmann, Otto, 4,345,363, Cl. 29-527.400.
Kabushiki Kaisha Morita Seisakusho: *See—*
Suzuki, Masakazu; Furuichi, Shuhei; and Ikeda, Toshiaki, 4,346,297, Cl. 378-110.000.
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Tamura, Shigeru, 4,346,403, Cl. 358-93.000.
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Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,345,782, Cl. 280-803.000.
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Nakayama, Shozo; Hattori, Mitsuhiro; and Ono, Hiromitsu, 4,345,886, Cl. 418-100.000.
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Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,345,771, Cl. 277-205.000.
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Baumann, John S.; Knipp, Roger W.; and Kacin, Joseph J., 4,346,426, Cl. 361-151.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Ridout, Robert A., 4,345,360, Cl. 29-159.010.
Kajioka, Yasuo: *See—*
Suzuki, Yoshinobu; Chiba, Kiyoshi; Tukuhiro, Tomoya; Iwasawa, Yoshiyuki; Kajioka, Yasuo; and Komine, Tomio, 4,345,431, Cl. 60-286.000.
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Kakuta, Atsushi; Suzuki, Shigeo; Mori, Yasuki; and Morishita, Hirosada, to Hitachi, Ltd. Complex type electrophotographic plate. 4,346,157, Cl. 430-58.000.
Kalasz, Huba: *See—*
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Kalchev, Dimitar: *See—*
Longiny, Michael A.; Kalchev, Dimitar; and Zinn, Thomas K., 4,345,884, Cl. 417-359.000.
Kalif, Eitan. High-lift attachment for an agricultural tractor provided with a three-point linkage. 4,345,871, Cl. 414-703.000.
Kallet, Eli A., to Farrand Optical Co., Inc. Enhanced fluorescent emission. 4,345,837, Cl. 356-317.000.
Kamata, Shohichi; Kimura, Yoshinori; and Hirai, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Diode faults detecting apparatus. 4,346,347, Cl. 324-158.00D.
Kamata, Yuzuru: *See—*
Endo, Fumihiro; Ishikawa, Toshio; Ozawa, Jun; Kamata, Yuzuru; and Shiono, Shigeo, 4,345,471, Cl. 374-188.000.
Kanamori, Terutoshi; and Manabe, Toyotaka, to Nippon Telegraph & Telephone Public Corp. Glass for optical fiber. 4,346,176, Cl. 501-37.000.
Kanchev, Peter K., to Bulgarsko Radio. Compensator for horizontal angular error of a record-player arm. 4,346,466, Cl. 369-250.000.
Kanebo Limited: *See—*
Kajiura, Toshihiro; Masaki, Chiaki; and Mori, Masahiro, 4,346,366, Cl. 340-146.30R.
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, 4,346,146, Cl. 428-398.000.
Kanebo Synthetic Fibers, Ltd.: *See—*
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, 4,346,146, Cl. 428-398.000.
Kaneko, Nobuo; and Yamamoto, Masaru, to Mitsui Mining & Smelting Co., Ltd. Aluminum-based die casting alloys. 4,345,953, Cl. 148-32.000.
Kaneko, Takashi; and Iwasaka, Tatsuo, to Hitachi, Ltd. Elevator control system. 4,345,670, Cl. 187-29.00R.
Kanengieter, Glenn G.: *See—*
Schwalenberg, Terry R.; Krumholz, Frank C.; Kanengieter, Glenn G.; and Henkensiefken, Larry L., 4,345,421, Cl. 56-341.000.
Kantor, Philip A. Head and neck support cushions. 4,345,347, Cl. 5-441.000.
Kao Soap Co., Ltd.: *See—*
Kazama, Yoshiteru; Kokubo, Isao; Tsuji, Akitoshi; and Tanino, Yukio, 4,345,944, Cl. 106-90.000.
Kapura, Edward M., to PPG Industries, Inc. Method of and apparatus for vertically positioning devices in glass forming chamber. 4,345,929, Cl. 65-99.500.
Karlberg, Niels G.; and Pedersen, Poul H. H., to Danfoss A/S. Hydraulic steering and operating device. 4,345,614, Cl. 137-340.000.
Karlin, Richard A.: *See—*
Barlow, Gordon A.; Krutsch, John R.; and Karlin, Richard A., 4,345,764, Cl. 273-313.000.
Karmin, Irving. Tape cassette. 4,345,540, Cl. 116-278.000.
Kasai, Kiyoshi; Kubota, Yoshitaka; and Tsukidate, Takaaki, to Toyo Soda Manufacturing Co., Ltd. Process for preparing high-purity α-type silicon nitride. 4,346,068, Cl. 423-344.000.
Kasai, Masaji: *See—*
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Kasielke, Joachim: *See—*
Paletta, Benno; Moller, Reinhard; and Kasielke, Joachim, 4,345,483, Cl. 73-864.160.
Kasting, Edward W.; Glasson, Richard E.; and Swank, Bryan W., to Cummins Engine Company, Inc. Rocker housing and rocker cover. 4,345,552, Cl. 123-90.380.
Katayama, Aisuke. Dual moduli exponent transform type high speed multiplication system. 4,346,451, Cl. 364-746.000.
Katner, Allen S., to Eli Lilly and Company. Bis-tetrazoylmethyl substituted cephalosporin antibiotics. 4,346,076, Cl. 424-246.000.
Kato, Hisatoyo; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Gradation processing method for a radiation image recording system. 4,346,406, Cl. 358-110.000.
Kato, Hisatoyo: *See—*
Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, 4,346,409, Cl. 358-280.000.
Tanaka, Kazuyoshi; Kato, Hisatoyo; and Matsumoto, Seiji, 4,346,295, Cl. 250-327.200.
Kato, Toshikazu, to Olympus Optical Co., Ltd. Braking mechanism of a tape recorder. 4,345,725, Cl. 242-204.000.
Katsono, Mitsuaki: *See—*
Moriya, Shigeru; Ogawa, Hisashi; and Katsono, Mitsuaki. 4,345,780, Cl. 280-802.000.
Katsuno, Mitsuaki: *See—*
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,345,782, Cl. 280-803.000.
Katz, Harry S.; and Schneider, Sidney. Denture means and method. 4,345,900, Cl. 433-171.000.
Katzman, Allison W.; Holahan, Edward T.; Zaruba, John V.; and Morrison, Howard J., to Marvin Glass & Associates. Plush bank. 4,345,400, Cl. 46-4.000.
Kaufmann, Helmut, to Balzers Aktiengesellschaft. Method of depositing hard wear-resistant coatings on substrates. 4,346,123, Cl. 427-38.000.
Kaufmann, Rainer, to Aristo Graphic Systeme GmbH & Co. Method and apparatus to control a drawing machine attached to a computer by means of a digitizing device. 4,346,260, Cl. 178-18.000.
Kawachi, Masao; Tomaru, Satoru; Edahiro, Takao; and Suto, Shoichi, to Nippon Telegraph & Telephone Public Corporation. Fabrication method of single-mode optical fiber preforms. 4,345,928, Cl. 65-18.200.
Kawai, Hisasi; Sakurai, Kazuhiro; and Matsumoto, Muneaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Linear solenoid valve actuation device. 4,345,737, Cl. 251-129.000.
Kawamura, Masanori: *See—*
Tanouchi, Tadao; Kawamura, Masanori; Okada, Takanori; and Hayashi, Masaki, 4,346,099, Cl. 424-273.00R.
Kawamura, Yoshihisa; Matsuto, Kesao; and Saito, Masaaki, to Nissan Motor Company, Limited. Fuel injection valve drive system. 4,345,564, Cl. 123-490.000.
Kawazoe, Soichi: *See—*
Suzuki, Nagatoshi; Araki, Sadaakira; and Kawazoe, Soichi, 4,345,572, Cl. 123-568.000.
Kay, David B.: *See—*
Kramer, Charles J.; Kay, David B.; and Snelling, Christopher, 4,345,835, Cl. 355-3.00R.
Kay, Franklin J. Material transfer apparatus. 4,345,680, Cl. 198-304.000.
Kay Plastic Products, Inc.: *See—*
Di Cicco, Angelo S.; and Quave, Walter N., 4,345,615, Cl. 137-343.000.
Kazama, Yoshiteru; Kokubo, Isao; Tsuji, Akitoshi; and Tanino, Yukio, to Kao Soap Co., Ltd. Cement additive. 4,345,944, Cl. 106-90.000.
Kempf, Bertrand. Convertible table, especially for games. 4,345,758, Cl. 273-30.000.
Kennecott Corporation: *See—*
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,346,049, Cl. 264-65.000.
Kennedy, Jerome J.: *See—*
White, Charles A.; Kennedy, Jerome J.; and Wayne, Harold S., 4,345,682, Cl. 198-635.000.
Kerey, Gyorgy: *See—*
Takacs, Istvan; Vereczkey, Endre; Bosits, Gyula; and Kerey, Gyorgy, 4,345,720, Cl. 241-74.000.
Keung, Poon C.; and Fu, Yiu. Double lock. 4,345,447, Cl. 70-38.00A.
Kibun Co., Ltd.: *See—*
Yamashita, Shunroku, 4,345,443, Cl. 62-380.000.
Kimura Bed Mfg. Company Limited: *See—*
Saito, Shuichi, 4,345,341, Cl. 4-301.000.
Saito, Shuiichi, 4,345,342, Cl. 4-301.000.
Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, to Mita Industrial Company Limited. Transfer type electrostatic copying apparatus. 4,345,834, Cl. 355-3.00R.
Kimura, Shinji: *See—*
Tohda, Masayuki; Takao, Hiroshi; and Kimura, Shinji, 4,345,985, Cl. 204-192.0EC.
Kimura, Yoshinori: *See—*
Kamata, Shohichi; Kimura, Yoshinori; and Hirai, Katsumi, 4,346,347, Cl. 324-158.00D.
King, Francis D.: *See—*
Hadley, Michael S.; King, Francis D.; and Martin, Roger T., 4,346,089, Cl. 424-248.520.
King, John L. Conveyor system for loading and unloading trucks and trailers. 4,345,869, Cl. 414-520.000.
King, Kenneth G.: *See—*
Garrett, John M.; and King, Kenneth G., 4,346,309, Cl. 307-252.00M.
Kinoshita, Ryoichi; and Orihara, Shobu, to Fujitsu Limited. Magnetic bubble device. 4,346,456, Cl. 365-36.000.
Kinsbron, Eliezer; and Vratny, Frederick, to Bell Telephone Laboratories, Incorporated. Removing hardened organic materials during fabrication of integrated circuits using anhydrous hydrazine solvent. 4,346,125, Cl. 427-96.000.
Kirkpatrick, Robert G.; and Snyder, Ronald R., to General Electric Company. Gun mount. 4,345,504, Cl. 89-37.0GM.
Kishimoto, Masaru: *See—*
Hara, Yoshihumi; Kubota, Saburo; Ihara, Akira; Kishimoto, Masaru; and Suzuki, Masaki, 4,345,472, Cl. 73-462.000.
Kiss, Janos: *See—*
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.
Kissei Pharmaceutical Co., Ltd.: *See—*
Tanouchi, Tadao; Kawamura, Masanori; Okada, Takanori; and Hayashi, Masaki, 4,346,099, Cl. 424-273.00R.
Kitsukawa, Kazumi: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,346,025, Cl. 524-141.000.
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Cyclohexyl phenethylether used for combatting tobacco beetles. 4,346,080, Cl. 424-84.000.
Kiyohara, Takao: *See—*
Sanjiki, Tetsutaro; Seta, Akinori; and Kiyohara, Takao, 4,346,096, Cl. 424-273.00R.
Kiyono, Yasuhiro: *See—*
Iwakiri, Norio; and Kiyono, Yasuhiro, 4,346,275, Cl. 200-314.000.
Klein, Andrew: *See—*
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,346,190, Cl. 524-522.000.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Methyl substituted norbornane carboxaldehyde dimethyl acetals. 4,346,243, Cl. 568-591.000.
Klingel, Hans: *See—*
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Kloeckner-Werke AG: *See*—
Lindenmayer, Bernhard; and Fink, Lothar, 4,345,965, Cl. 156-500.000.
Kloppner, Hans-Jurgen: *See*—
Leuchs, Ottmar; Kloppner, Hans-Jurgen; and Uhlmann, Otto, 4,345,363, Cl. 29-527.400.
Klose, Peter H.: *See*—
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Knipp, Roger W.: *See*—
Baumann, John S.; Knipp, Roger W.; and Kacin, Joseph J., 4,346,426, Cl. 361-151.000.
Knobel, Kenneth M.: *See*—
Balzer, Winton E.; and Knobel, Kenneth M., 4,345,412, Cl. 53-297.000.
Knox, Jack R., to Standard Oil Company (Indiana). Process for homogeneous curly synthetic polymer fibers. 4,346,052, Cl. 264-176.00F.
Knox, Phillip J.: *See*—
Moss, Lee C.; Knox, Phillip J.; and Snyder, Raymond W., 4,346,257, Cl. 174-72.00B.
Kobayashi, Akio: *See*—
Kondo, Toshio; Sagisaka, Yasuo; Tajima, Masahiko; and Kobayashi, Akio, 4,345,561, Cl. 123-440.000.
Kobayashi, Tetsuo: *See*—
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Kobe, Inc.: *See*—
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Kobylinski, Thaddeus P.: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,346,020, Cl. 252-429.00R.
Kobzar, Vladimir A.: *See*—
Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.
Koch, Klaus, to Hermann Berstorff Maschinenbau GmbH. Method for sealing the drive-side portion of a preparation and hydrogenation chamber for hydrogenating coal with hydrogen to form hydrocarbons. 4,345,988, Cl. 208-8.00R.
Kodama, Toshikazu: *See*—
Sato, Kouji; Takahashi, Sadao; and Kodama, Toshikazu, 4,346,322, Cl. 310-313.00B.
KOH-I-NOOR Rapidograph: *See*—
Leuenberger, Jean P.; Logan, David J.; and Scorso, Clifford A., Jr., 4,346,445, Cl. 364-520.000.
Kohl, Helmut, to Behringwerke Aktiengesellschaft. Diagnostic agent for the detection of bilirubin in body fluids and reagent suitable therefor. 4,345,911, Cl. 23-230.00B.
Kohn, Dieter: *See*—
Krull, Walther; Kohn, Dieter; and Schiller, Wolf-Dieter, 4,345,623, Cl. 137-637.200.
Koizumi, Shoji: *See*—
Sato, Yuji; and Koizumi, Shoji, 4,346,391, Cl. 346-136.000.
Kojima, Yasuhumi, to Nippondenso Co., Ltd. Control method and apparatus for air conditioners. 4,345,714, Cl. 236-46.00R.
Kokubo, Isao: *See*—
Kazama, Yoshiteru; Kokubo, Isao; Tsuji, Akitoshi; and Tanino, Yukio, 4,345,944, Cl. 106-90.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakai, Taiichiro; Sato, Masanori; Furusawa, Kahei; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Ejiri, Yoshihiro, 4,345,816, Cl. 350-96.200.
Koller, Manfred: *See*—
Wossner, Felix; Handke, Gunther; and Koller, Manfred, 4,345,748, Cl. 267-8.00R.
Kolomayets, George: *See*—
Dennis, James T.; and Kolomayets, George, 4,346,465, Cl. 369-230.000.
Komatsu, Makoto; Tanaka, Toru; and Fujita, Hideaki, to Mitsubishi Gas Chemical Company, Inc. Process for producing aromatic polycarboxylic acid. 4,346,232, Cl. 562-416.000.
Komeno, Taichiro: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,346,218, Cl. 544-16.000.
Komine, Tomio: *See*—
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Kommanditbolaget United Stirling AB & CO: *See*—
Bratt, Jan C., 4,345,645, Cl. 165-176.000.
Kondo, Toshio; Sagisaka, Yasuo; Tajima, Masahiko; and Kobayashi, Akio, to Nippondenso Co., Ltd. Air-fuel ratio control method and its apparatus. 4,345,561, Cl. 123-440.000.
Kondo, Yoshikazu; Yamamoto, Toshihiro; and Yamamoto, Takaji, to Kanebo, Ltd.; and Kanebo Synthetic Fibers, Ltd. Porous flame retardant acrylic synthetic fibers and a method for producing these fibers. 4,346,146, Cl. 428-398.000.
Kondoh, Shiroh: *See*—
Oshima, Yujiro; Fujitani, Yoshiyasu; Muraki, Hideaki; Kondoh, Shiroh; and Yokota, Kouji, 4,345,555, Cl. 123-272.000.
Koni, Tuyoshi; Urushida, Yoshihisa; and Tsuzuki, Akira, to Citizen Watch Company Limited. Anesthetic gas control apparatus. 4,345,612, Cl. 137-101.190.
Konishiroku Photo Industry Co., Ltd.: *See*—
Aratame, Kazuhisa, 4,345,830, Cl. 354-173.000.
Kono, Hiroshi: *See*—
Goto, Fumio; Yoshino, Kenji; Kono, Hiroshi; and Naito, Mitsuaki, 4,345,852, Cl. 404-114.000.
Kontar, Evgeny A.: *See*—
Lezgintsev, Georgy M.; Garbuz, Evgeny I.; Kontar, Evgeny A.; Glukhikh, Rudolf G.; Murdmaa, Ivar O.; Soluyanov, Vadim G.; Belyavsky, Alexandr S.; and Kuznetsov, Alexei N., 4,345,461, Cl. 73-170.00A.
Kopp, Clinton V.; and Shah, Dilip, to Baxter Travenol Laboratories, Inc. Diffusion membrane units with adhered semipermeable capillaries. 4,346,006, Cl. 210-321.400.
Korach, Malcolm, to PPG Industries, Inc. Cathode element for solid polymer electrolyte. 4,345,986, Cl. 204-266.000.
Kormendi, Ferenc: *See*—
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.
Koros, Peter J., to Jones & Laughlin Steel Incorporated. Desulfurizing process. 4,345,940, Cl. 75-58.000.
Kosaka, Jiro, to Meiko Industry Corporation, Limited. Water tank assembly for a pressure resistance measuring apparatus for testing containers. 4,345,458, Cl. 73-37.500.
Kosky, Philip G.: *See*—
Vakil, Himanshu B.; and Kosky, Philip G., 4,345,915, Cl. 48-197.00R.
Kovach, John J. Educational marble game. 4,345,760, Cl. 273-118.00R.
Koyanagi, Nozomu: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.
Kozma, Laszlo: *See*—
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.
Krabbenhoft, Herman O., to General Electric Company. Preparation of para-isopropenylphenol. 4,346,249, Cl. 568-782.000.
Kramer, Charles J.; Kay, David B.; and Snelling, Christopher, to Xerox Corporation. Multiple function reproduction apparatus. 4,345,835, Cl. 355-3.00R.
Kramer, Petrus A., to Shell Oil Company. Oxabicyclo[3.1.0]hexan-2-ones. 4,346,038, Cl. 549-302.000.
Kraus, George A., to Iowa State University Research Foundation, Inc. Synthesis of ochratoxins. 4,346,039, Cl. 549-289.000.
Krauss, Clifford J.: *See*—
Chow, Richard T.; Krauss, Clifford J.; and Ybema, Douwe, 4,345,980, Cl. 204-119.000.
Krautkramer-Branson, Inc.: *See*—
Bickel, Wolf, 4,345,475, Cl. 73-657.000.
Krebs, Clifton T.; and Krebs, Leonard B. Throat protector. 4,345,548, Cl. 119-108.000.
Krebs, Leonard B.: *See*—
Krebs, Clifton T.; and Krebs, Leonard B., 4,345,548, Cl. 119-108.000.
Krick, Gerd: *See*—
Sigdell, Jan-Erik; and Krick, Gerd, 4,345,999, Cl. 210-188.000.
Krings, Josef. Construction plate for a ditch construction device. 4,345,857, Cl. 405-282.000.
Krishnan, Sivaram; and Baron, Arthur L., to Mobay Chemical Corporation. Copolycarbonates prepared with 2,2'-bis(p-hydroxyphenyl) 1,1,1,3,3,3-hexafluoropropane. 4,346,211, Cl. 528-202.000.
Krook, Hans J.: *See*—
Berglund, Erling G.; and Krook, Hans J., 4,345,843, Cl. 366-219.000.
Krull, Walther; Kohn, Dieter; and Schiller, Wolf-Dieter, to Beth GmbH. Multiport disk valve, especially for dust-remover duct systems. 4,345,623, Cl. 137-637.200.
Krumholz, Frank C.: *See*—
Schwalenberg, Terry R.; Krumholz, Frank C.; Kanengieter, Glenn G.; and Henkensiefken, Larry L., 4,345,421, Cl. 56-341.000.
Krushko: *See*—
Cash, Jon B.; and Ludwig, Paul K., 4,345,518, Cl. 100-98.00R.
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Growdon, John H.; and Wurtman, Richard J., 4,346,085, Cl. 424-199.000.
Swartz, Mitchell R., 4,346,172, Cl. 435-168.000.

Massmann, Volker, to Robert Bosch GmbH. Method for the television scanning of films. 4,346,408, Cl. 358-214.000.

Mathews, Raymond D., to International Business Machines Corporation. Impact printer with dual helix character print elements. 4,345,846, Cl. 400-157.000.

Mathou, Marcel. Sound-damping assembly for a structure of a piece of furniture. 4,345,666, Cl. 181-207.000.

MATRA: *See—*
de Givry, Jacques, 4,345,362, Cl. 29-426.500.
Deplante, Michel, 4,345,662, Cl. 180-168.000.

Matsumoto, Muneaki: *See—*
Kawai, Hisasi; Sakurai, Kazuhiro; and Matsumoto, Muneaki, 4,345,737, Cl. 251-129.000.

Matsumoto, Seiji: *See—*
Ishida, Masamitsu; Kato, Hisatoyo; and Matsumoto, Seiji, 4,346,409, Cl. 358-280.000.
Tanaka, Kazuyoshi; Kato, Hisatoyo; and Matsumoto, Seiji, 4,346,295, Cl. 250-327.200.

Matsushita Electric Industrial Co., Ltd.: *See—*
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,345,517, Cl. 99-511.000.
Hara, Yoshihumi; Kubota, Saburo; Ihara, Akira; Kishimoto, Masaru; and Suzuki, Masaki, 4,345,472, Cl. 73-462.000.
Saito, Fumitoshi; Maeda, Sotomitsu; and Uetsuji, Toshio, 4,345,882, Cl. 417-312.000.
Takeyama, Kenichi; Morimoto, Takayoshi; and Hibino, Kunio, 4,346,163, Cl. 430-280.000.

Matsushita Graphic Communications Systems, Inc.: *See—*
Maeno, Tetsuo, 4,346,410, Cl. 358-281.000.

Matsushita Reiki Company, Limited: *See—*
Saito, Fumitoshi; Maeda, Sotomitsu; and Uetsuji, Toshio, 4,345,882, Cl. 417-312.000.

Matsushita, Terumi: *See—*
Isobe, Taketo; and Matsushita, Terumi, 4,346,392, Cl. 346-139.00C.

Matsuto, Kesao: *See—*
Kawamura, Yoshihisa; Matsuto, Kesao; and Saito, Masaaki, 4,345,564, Cl. 123-490.000.

Matsuura, Kazuo: *See—*
Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, 4,346,173, Cl. 435-189.000.

Matsuyama, Shigeru, to Canon Kabushiki Kaisha. Electronic calculator having item count display. 4,346,450, Cl. 364-710.000.

Matteson, Lawrence J.; Greenwald, Roger J.; and Schauffele, Carl N., to Eastman Kodak Company. Apparatus for automatic control of a photographic camera. 4,345,825, Cl. 354-23.00D.

Matthes, Hans; and Reifenrath, Klaus, to AEG-Elotherm, G.m.b.H. Short circuit disconnecting circuit. 4,346,423, Cl. 361-87.000.

Maurer, Alexander; Adrian, Renate; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for the manufacture of finely dispersed sparingly soluble salts of oxyacids of phosphorus. 4,346,065, Cl. 423-305.000.

Maurer, Jurg; and Rembold, Heinz, to Ciba-Geigy Corporation. Flowable, curable epoxy resin mixture. 4,346,207, Cl. 528-103.000.

Mautz, Karl-Heinz: *See—*
Schwarz, Alois; Mautz, Karl-Heinz; and Stephan, Michael, 4,345,876, Cl. 416-134.00A.

Maxon, Eric K.: *See—*
Schiff, Charles M.; Maxon, Eric K.; and West, Ronald E., 4,345,847, Cl. 403-103.000.

Mayumi, Masakatsu; Mitooka, Kenji; and Fujiwara, Sigeharu, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Pipe joints of reinforced resin and process for their molding. 4,345,625, Cl. 138-141.000.

McCarrell, Stuart G. Tonsil snare. 4,345,599, Cl. 128-320.000.

McCarthy, Harry E.; French, Gordon B.; and Cook, Melvin A., to Occidental Oil Shale, Inc. Placement of explosive for forming in situ oil shale retort. 4,345,794, Cl. 299-2.000.

McCarthy, Walton W. Solar process. 4,345,974, Cl. 203-19.000.

McClure, David E.: *See—*
Baldwin, John J.; and McClure, David E., 4,346,042, Cl. 549-557.000.

McConnell, William K., Jr.; and Campbell, Charles M., to Crane Co. Media. 4,345,997, Cl. 210-150.000.

McCranie, Stephen C.; and Houseman, Andrew J., to Sav-A-Stop Incorporated. Box lidding system and apparatus. 4,345,413, Cl. 53-315.000.

McDonald, Ian A.: *See—*
Palfreyman, Michael G.; and McDonald, Ian A., 4,346,110, Cl. 424-319.000.

McElroy, Arthur H.: *See—*
Cox, Russell C.; and McElroy, Arthur H., 4,345,956, Cl. 156-198.000.

McElroy, David J., to Texas Instruments Incorporated. Method of making a dynamic memory array. 4,345,364, Cl. 29-571.000.

McFarlin, David J., to United Technologies Corporation. Method of press forming a zeolite article. 4,346,051, Cl. 264-102.000.

McGill, Robert W.: *See—*
Erbstein, Robert S.; Richard, Gary R.; Palmatier, Roland T.; and McGill, Robert W., 4,346,446, Cl. 364-551.000.

McHenney, John R., to International Harvester Co. Wire harness retainer clip. 4,345,806, Cl. 339-19.000.

McInnis, Stirling A. Speed control of a D.C. electric motor. 4,346,335, Cl. 318-351.000.

McLaen, Donald F.; and Herz, Arthur H., to Eastman Kodak Company. Antistain agent or antistain agent precursor in photographic silver halide element. 4,346,154, Cl. 430-14.000.

McMurtry, Carl H.: *See—*
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,346,049, Cl. 264-65.000.

McNeece, Paul W. . uel heating apparatus for vehicles. 4,345,570, Cl. 123-557.000.

Mead Corporation, The: *See—*
Wiley, Robert A., 4,346,388, Cl. 346-75.000.

Mechanical Technology Incorporated: *See—*
Dineen, John J., 4,345,437, Cl. 60-521.000.
Dorman, Richard A., 4,345,442, Cl. 62-160.000.

Medi-Timer Corporation: *See—*
Villa-Real, Antony-Euclid C., 4,345,541, Cl. 116-308.000.

Meier, Helmut: *See—*
Schmidt, Adolf; Meier, Helmut; Schedrat, Gunther; and Bockmann, August, 4,346,203, Cl. 526-225.000.

Meiko Industry Corporation, Limited: *See—*
Kosaka, Jiro, 4,345,458, Cl. 73-37.500.

Meissner, Herman P., to Institute of Gas Technology. Process for purification of gas streams. 4,345,918, Cl. 55-38.000.

Mercer, James B. Therapeutic treatment for viral hepatitis infection. 4,346,095, Cl. 424-273.00R.

Merck & Co., Inc.: *See—*
Baldwin, John J.; and McClure, David E., 4,346,042, Cl. 549-557.000.

Merkel, Wolfgang: *See—*
Hoffmann, Gerhart; Cordes, Rudolph; and Merkel, Wolfgang, 4,346,230, Cl. 560-99.000.

Merrell Toraude et Compagnie: *See—*
Palfreyman, Michael G.; and McDonald, Ian A., 4,346,110, Cl. 424-319.000.

Merrifield, Donald V. Automatic steering system for a towed vehicle. 4,345,775, Cl. 280-443.000.

Merrill Lynch, Pierce, Fenner & Smith Incorporated: *See—*
Musmanno, Thomas E., 4,346,442, Cl. 364-408.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Schwarz, Alois; Mautz, Karl-Heinz; and Stephan, Michael, 4,345,876, Cl. 416-134.00A.

Messing, Wayne P.: *See—*
Ovshinsky, Stanford R.; Klose, Peter H.; and Messing, Wayne P., 4,346,449, Cl. 364-900.000.

Metako Kigyo Co., Ltd.: *See—*
Fukuchi, Shigeki, 4,345,636, Cl. 160-297.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Rammler, Roland, 4,345,914, Cl. 44-10.00C.

Metaux Precieux S.A.: *See*—
Romagnoli, Mario, 4,345,901, Cl. 433-172.000.
Metraflu: *See*—
Barat, Jean, 4,345,478, Cl. 73-861.090.
Metzger, Harold W.: *See*—
Herzl, Peter J.; Metzger, Harold W.; and Crumley, Richard L., 4,345,464, Cl. 73-201.000.
Meudt, Werner J.: *See*—
Thompson, Malcolm J.; Mandava, Nagabhushanam; Worley, Joseph F., deceased; Meudt, Werner J.; Dutky, Samson R.; Robbins, William E.; and Flippen-Anderson, Judith L., 4,346,226, Cl. 549-268.000.
Meyer, Jerry R.: *See*—
Bartoli, Filbert J.; and Meyer, Jerry R., 4,346,348, Cl. 324-158.00R.
Meyer, Klaus, to Hoechst Aktiengesellschaft. Gelated fertilizers, process for their manufacture and their use in plant fertilization. 4,345,931, Cl. 71-28.000.
Meyer, Thomas N., to Westinghouse Electric Corp. Circuit-interrupter having a high-frequency transverse magnetic field to assist in arc interruption. 4,346,273, Cl. 200-147.00R.
Michel, Helmut: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Bartsch, Wolfgang; and Dietmann, Karl, 4,346,093, Cl. 424-269.000.
Michelin Recherche et Technique S.A.: *See*—
Giron, Daniel G., 4,345,634, Cl. 152-353.00R.
Micheron, Francois, to Thomson-CSF. Process for manufacturing a piezoelectric transducer made from a polymer material. 4,345,359, Cl. 29-25.350.
Mihelich, Edward D., to Procter & Gamble Company, The. Novel prostaglandin analogues and process for making same. 4,345,984, Cl. 204-162.00R.
Mikami, Masashi: *See*—
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,345,517, Cl. 99-511.000.
Miletti, Jose A.: *See*—
Devine, James A.; and Miletti, Jose A., 4,345,469, Cl. 73-338.600.
Milkovich, Ralph: *See*—
Doak, Kenneth; Bi, Le-Khac; and Milkovich, Ralph, 4,346,198, Cl. 525-314.000.
Miller, Alton K., to Carborundum Company, The. Apparatus for electron curing of resin coated webs. 4,345,545, Cl. 118-621.000.
Miller, Normal L.: *See*—
Garrett, Thomas B.; Herweh, John E.; Magnusson, Alan B.; and Miller, Normal L., 4,346,186, Cl. 524-82.000.
Miller, Richard H.: *See*—
Bryans, Thomas J.; Miller, Richard H.; and Single, Arthur W., II, 4,345,791, Cl. 297-250.000.
Miller, Wayne R., to Deere & Company. Vehicle emergency steering system. 4,345,660, Cl. 180-133.000.
Mills, Leland F.: *See*—
Mims, John D.; Mills, Leland F.; and Fowler, Ronald I., 4,345,960, Cl. 156-264.000.
Mills, Walter C.; and Patterson, James W., to InterNorth, Inc. Pressure-operated portable siphon apparatus for removing concentrations of liquid from a gas pipeline. 4,345,613, Cl. 137-317.000.
Mims, Charles A.: *See*—
Vernon, Lonnie W.; Veluswamy, Lavanga R.; Euker, Charles A., Jr.; and Mims, Charles A., 4,345,989, Cl. 208-10.000.
Mims, John D.; Mills, Leland F.; and Fowler, Ronald I., to Crathern Engineering Co., Inc. System for and method of laminating. 4,345,960, Cl. 156-264.000.
Minagawa, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Suspension for vehicles. 4,345,778, Cl. 280-701.000.
Minagawa, Motonobu: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,346,025, Cl. 524-141.000.
Minasov, Alexandr N.; Suslov, Alexandr N.; Azimov, Alexandr A.; and Marapulets, Gennady N. Coke dry quenching plant. 4,345,867, Cl. 414-287.000.
Mincsovics, Emil: *See*—
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.
Misaki, Hideo: *See*—
Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, 4,346,173, Cl. 435-189.000.
Mishima, Hiroshi: *See*—
Takiguchi, Yo; Mishima, Hiroshi; Yamamoto, Shinjiro; and Terao, Michiya, 4,346,171, Cl. 435-119.000.
Mita Industrial Company Limited: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, 4,345,834, Cl. 355-3.00R.
Mitooka, Kenji: *See*—
Mayumi, Masakatsu; Mitooka, Kenji; and Fujiwara, Sigeharu, 4,345,625, Cl. 138-141.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujiwara, Kohei; and Hosogai, Setsuo, 4,346,356, Cl. 335-6.000.
Hirasawa, Kazuo; and Kubo, Takahiro, 4,346,471, Cl. 369-44.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Komatsu, Makoto; Tanaka, Toru; and Fujita, Hideaki, 4,346,232, Cl. 562-416.000.
Mitsubishi Rayon Company, Limited: *See*—
Asai, Hajime; Tada, Hisashi; and Gomi, Takeo, 4,345,959, Cl. 156-244.110.
Mitsui Engineering and Shipbuilding Co. Ltd.: *See*—
Kunitake, Yoshikuni, 4,345,533, Cl. 114-61.000.
Mitsui Kensetsu Kabushiki Kaisha: *See*—
Abe, Hideshi; and Tonooka, Koji, 4,345,975, Cl. 203-37.000.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Kaneko, Nobuo; and Yamamoto, Masaru, 4,345,953, Cl. 148-32.000.
Mitteldorf, Arthur J.; Marcovecchio, Joseph; and Boquiron, Rodolfo A., to Spex Industries Inc. Cell for containing fluid to be analyzed by x-ray spectroscopy. 4,346,299, Cl. 378-204.000.
Mittex Aktiengesellschaft: *See*—
Hussmann, Peter, 4,345,917, Cl. 55-33.000.
Miyagawa, Tuyoshi; and Manabe, Hitoshi, to Laurel Bank Machine Co., Ltd. Device for stopping suction heads of paper sheet counting apparatus at determined angular positions. 4,346,289, Cl. 235-98.00R.
Miyaji, Hiromi: *See*—
Nakamura, Kunihiko; and Miyaji, Hiromi, 4,345,752, Cl. 271-12.000.
Miyamoto, Keiichi; Inoue, Naohiko; and Takeuchi, Yasuhisa, to Nissan Motor Company, Limited. Aerial transport system. 4,345,522, Cl. 104-89.000.
Miyamura, Nobuhiro: *See*—
Takigawa, Hiroyoshi; and Miyamura, Nobuhiro, 4,345,632, Cl. 152-209.00R.
Miyata Industry Company Limited: *See*—
Umaba, Toshihiko; and Ito, Tadashi, 4,346,012, Cl. 252-7.000.
Miyazaki, Kunio: *See*—
Anno, Nobuo; Okui, Haruki; Yamamoto, Kuniyuki; and Miyazaki, Kunio, 4,345,664, Cl. 180-230.000.
Mizuno, Masami: *See*—
Yasuda, Yasushi; Mizuno, Masami; Nishikawa, Hiroaki; and Murakami, Akira, 4,346,098, Cl. 424-273.00R.
Mizuno, Yutaka: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,346,206, Cl. 528-88.000.
Mobay Chemical Corporation: *See*—
Krishnan, Sivaram; and Baron, Arthur L., 4,346,211, Cl. 528-202.000.
Mochida, Haruo; and Kobayashi, Tetsuo, to Nissan Motor Company, Limited; and Nippon Cable System, Inc. Nut control device. 4,345,863, Cl. 411-252.000.
Mocquet, Gisele C.: *See*—
Langlois, Michel; Lacour, Alain P.; Bucher, Bernard P.; and Mocquet, Gisele C., 4,346,102, Cl. 424-279.000.
Moen, Lenard E. Making of containers with tri-laminated end walls. 4,345,905, Cl. 493-171.000.
Mohai nee Nagy, Zsuzsanna: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; Bagdy, Daniel; and Mohai nee Nagy, Zsuzsanna, 4,346,078, Cl. 424-177.000.
Mohler, Hanns: *See*—
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,030, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,031, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,032, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,033, Cl. 260-239.30B.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,034, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,035, Cl. 260-239.30T.
Gerecke, Max; Haefely, Willy; Hunkeler, Walter; Kyburz, Emilio; Mohler, Hanns; Pieri, Lorenzo; and Polc, Petar, 4,346,036, Cl. 260-239.30T.
Mohr, Sigo, Jr.; and Carter, Jerry L., to Joshua L. Baily & Co., Inc. Stretchable woven cellulosic fabric and process for making same. 4,345,908, Cl. 8-111.000.
Mohrle, Werner: *See*—
Drews, Ulrich; Werner, Peter; and Mohrle, Werner, 4,345,562, Cl. 123-440.000.
Molin, Nils: *See*—
Enfors, Sven-Olof; Molin, Nils; and Montelin, Eugen, 4,346,175, Cl. 435-317.000.
Molins, Ltd.: *See*—
Barton, Ronald S. C., 4,345,709, Cl. 226-195.000.
Moller, Reinhard: *See*—
Paletta, Benno; Moller, Reinhard; and Kasielke, Joachim, 4,345,483, Cl. 73-864.160.
Monjes, Julio A. Cascade solar heater. 4,345,586, Cl. 126-449.000.
Monroe, Robert C., to Hudson Products Corporation. Axial flow fans and blades therefor. 4,345,877, Cl. 416-239.000.
Monsanto Company: *See*—
Alt, Gerhard H., 4,345,938, Cl. 71-118.000.
Griffith, Edward J., 4,346,028, Cl. 524-417.000.
Peng, Fred M.; and Tokas, Edward F., 4,346,199, Cl. 525-316.000.
Van Eenam, Donald N., 4,346,027, Cl. 524-377.000.
Woodbrey, James C., 4,346,200, Cl. 525-421.000.

Montag, Bernhard; and Optiz, Heinrich, to Siemens Aktiengesellschaft. Method of making families of steady-state heat transfer coefficient curves visible by photochemical means. 4,346,166, Cl. 430-435.000.

Montedison S.p.A.: *See—*
Ruvolo, Antonio; and Massa, Vincenzo, 4,346,127, Cl. 427-244.000.

Montelin, Eugen: *See—*
Enfors, Sven-Olof; Molin, Nils; and Montelin, Eugen, 4,346,175, Cl. 435-317.000.

Monterey Manufacturing, Inc.: *See—*
Hall, Charles P., 4,345,348, Cl. 5-450.000.

Montgomery, James W.: *See—*
Baugh, John L.; and Montgomery, James W., 4,345,649, Cl. 166-120.000.

Monticelli, Dennis M.; Howard, William M.; and Sleeth, Robert S., to National Semiconductor Corporation. Simultaneous communication of analog and binary information in a single frame of a pulse count modulated digital signal. 4,346,380, Cl. 340-825.630.

Moore, Richard C. Container for making a tea beverage. 4,345,512, Cl. 99-323.000.

Moore, William H.: *See—*
Krutak, James J.; Maleski, Robert J.; and Moore, William H., 4,346,161, Cl. 430-223.000.

Morfitt, John B., to Lantec Industries Ltd. Regenerative hydraulic interlock system. 4,345,742, Cl. 254-291.000.

Morgan Adhesives Company: *See—*
Laurent, Jacques J., 4,346,189, Cl. 524-267.000.

Mori, Masahiro: *See—*
Kajiura, Toshihiro; Masaki, Chiaki; and Mori, Masahiro, 4,346,366, Cl. 340-146.30R.

Mori, Yasuki: *See—*
Kakuta, Atsushi; Suzuki, Shigeo; Mori, Yasuki; and Morishita, Hirosada, 4,346,157, Cl. 430-58.000.

Morichika, Toshiaki: *See—*
Hiraishi, Hisashi; Morichika, Toshiaki; and Murakami, Shinichi, 4,345,941, Cl. 75-122.000.

Morimoto, Takayoshi: *See—*
Takeyama, Kenichi; Morimoto, Takayoshi; and Hibino, Kunio, 4,346,163, Cl. 430-280.000.

Morin, Claude, to Pechiney Ugine Kuhlmann. Water heater using solar and non-solar energy. 4,345,583, Cl. 126-427.000.

Morinaga, Masaru, to NSK-Warner K.K. Retractor provided with a take-up force reducing mechanism. 4,345,723, Cl. 242-107.000.

Morinaga, Shigeki, to Hitachi, Ltd. Apparatus for controlling an electric motor. 4,346,434, Cl. 364-183.000.

Morishita, Hirosada: *See—*
Kakuta, Atsushi; Suzuki, Shigeo; Mori, Yasuki; and Morishita, Hirosada, 4,346,157, Cl. 430-58.000.
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,346,206, Cl. 528-88.000.

Moriya, Shigeru; Ogawa, Hisashi; and Katsono, Mitsuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic seatbelt system. 4,345,780, Cl. 280-802.000.

Morley, David W.: *See—*
Morley, Fred W., 4,345,514, Cl. 99-349.000.

Morley, Fred W., to Morley, David W. Continuous hamburger grill. 4,345,514, Cl. 99-349.000.

Morley, Robert G.; and Ashton, W. Ronald, to Landwide Foods, Inc. Frozen dessert product. 4,346,120, Cl. 426-565.000.

Morokawa, Shigeru; and Iwakura, Ryoji, to Citizen Watch Co., Ltd. FET Quartz oscillators. 4,346,350, Cl. 331-116.0FE.

Morrison, Howard J.: *See—*
Hanson, Steven P.; Smathers, Robert E.; and Morrison, Howard J., 4,345,402, Cl. 46-206.000.
Katzman, Allison W.; Holahan, Edward T.; Zaruba, John V.; and Morrison, Howard J., 4,345,400, Cl. 46-4.000.

Moseley, Gordon P.; and Christner, Kurt W., to Super Shops, Inc. Multi-spark CD ignition. 4,345,576, Cl. 123-604.000.

Mosley, Joseph M.: *See—*
Berndlmaier, Erich; Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., 4,346,343, Cl. 323-282.000.

Moss, Lee C.; Knox, Phillip J.; and Snyder, Raymond W., to Eldre Components, Inc. Laminated bus bar with dielectric ceramic inserts. 4,346,257, Cl. 174-72.00B.

Moss, Theron C.; Boring, Earl; and Hjellum, Jerry, to SECO Industries, Inc. Extension handle for dust mops and the like. 4,345,351, Cl. 15-144.00B.

Motizuki, Mikio: *See—*
Sekigawa, Kenji; Sato, Takeshi; and Motizuki, Mikio, 4,345,372, Cl. 29-874.000.

Motley, Larry L., to Griffin, Jewell C., Jr., a part interest. Bleacher structure. 4,345,406, Cl. 52-8.000.

Motoike, Jun: *See—*
Yoda, Haruo; and Motoike, Jun, 4,346,405, Cl. 358-105.000.

Motonami, Masanao: *See—*
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,345,781, Cl. 280-802.000.
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,345,782, Cl. 280-803.000.

Motorola, Inc.: *See—*
Carter, Ernest A., 4,346,310, Cl. 307-264.000.
Groves, Stanley E., 4,346,452, Cl. 364-900.000.
James, Kristi L.; and Shields, A. L., 4,345,969, Cl. 156-659.100.
Kyu, Shikun; and Hepworth, Edward C., 4,346,440, Cl. 364-200.000.

Mottine, John J., Jr.: *See—*
Choi, Jae H.; Mottine, John J., Jr.; Sparzak, Walter J., Sr.; and Vesperman, William C., 4,346,145, Cl. 428-389.000.

Mrozik, Herbert: *See—*
Berzen, Josef; and Mrozik, Herbert, 4,345,656, Cl. 173-131.000.

Muehling, Alois: *See—*
Pirner, Paul; and Muehling, Alois, 4,346,359, Cl. 335-202.000.

Muir, Francis, to Chevron Research Company. Seismic exploration using vibratory sources, sign-bit recording, and processing that maximizes the obtained subsurface information. 4,346,461, Cl. 367-39.000.

Mukainakano, Siniti: *See—*
Hattori, Tadashi; Mukainakano, Siniti; and Yoshida, Hitoshi, 4,345,569, Cl. 123-549.000.

Muller, Alfred; Schwab, Manfred; Feder, Meinrad; Schreiber, Achim; and Sauer, Joseph, to Robert Bosch GmbH. Hydraulic control system for servos in automatic transmissions. 4,345,489, Cl. 74-752.00A.

Muller, Arnold; and Brockel, Gerhard, to Sulzer Brothers Limited. Biologically implantable member for a tendon and/or ligament. 4,345,339, Cl. 3-1.000.

Mullich, Richard O., to TRE Corporation. High security cylindrical bored lock. 4,345,449, Cl. 70-153.000.

Multinorm, B.V.: *See—*
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,345,420, Cl. 56-295.000.

Mundt, Peter: *See—*
Urban, Otfried; and Mundt, Peter, 4,345,707, Cl. 226-68.000.

Murai, Shinji: *See—*
Sonoda, Noboru; Murai, Shinji; and Takii, Kazuhisa, 4,346,235, Cl. 562-596.000.

Murakami, Akira: *See—*
Yasuda, Yasushi; Mizuno, Masami; Nishikawa, Hiroaki; and Murakami, Akira, 4,346,098, Cl. 424-273.00R.

Murakami, Hiroyasu: *See—*
Shinbori, Kenichi; Sakai, Shinji; Shinoda, Nobuhiko; Ito, Tadashi; and Murakami, Hiroyasu, 4,345,829, Cl. 354-37.000.

Murakami, Shinichi: *See—*
Hiraishi, Hisashi; Morichika, Toshiaki; and Murakami, Shinichi, 4,345,941, Cl. 75-122.000.

Muraki, Hideaki: *See—*
Oshima, Yujiro; Fujitani, Yoshiyasu; Muraki, Hideaki; Kondoh, Shiroh; and Yokota, Kouji, 4,345,555, Cl. 123-272.000.

Murasawa, Toyoaki: *See—*
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,345,517, Cl. 99-511.000.

Murata Manufacturing Co., Ltd.: *See—*
Nakamura, Toshikazu; and Yoshida, Hirofumi, 4,346,285, Cl. 219-381.000.

Murdmaa, Ivar O.: *See—*
Lezgintsev, Georgy M.; Garbuz, Evgeny I.; Kontar, Evgeny A.; Glukhikh, Rudolf G.; Murdmaa, Ivar O.; Soluyanov, Vadim G.; Belyavsky, Alexandr S.; and Kuznetsov, Alexei N., 4,345,461, Cl. 73-170.00A.

Murphy, Andrew J.; Rhodes, Robert P.; and Woodruff, Terry A., to Hewlett-Packard Company. Automatic ignition system for a flame ionization detector. 4,346,055, Cl. 422-54.000.

Musmanno, Thomas E., to Merrill Lynch, Pierce, Fenner & Smith Incorporated. Securities brokerage-cash management system. 4,346,442, Cl. 364-408.000.

Muto, Katsuya: *See—*
Nakamoto, Takeshi; Iwaki, Katsutaro; Muto, Katsuya; Itoh, Katsumi; and Akita, Yoshio, 4,346,338, Cl. 322-28.000.

Mutoh Industry Ltd.: *See—*
Isobe, Taketo; and Matsushita, Terumi, 4,346,392, Cl. 346-139.00C.

Mutschler, Erich; and Weber, Adam, to ITT Industries, Inc. Fastening device for a switch. 4,346,274, Cl. 200-296.000.

Naarden International N.V.: *See—*
Roehl, Ernst-Ludwig, 4,346,079, Cl. 424-65.000.

Nagaishi, Hatsuo: *See—*
Nakamura, Koyo; and Nagaishi, Hatsuo, 4,345,560, Cl. 123-440.000.

Naganuma, Nobuyuki, to Brother Kogyo Kabushiki Kaisha. Rotary electromagnetic actuator. 4,346,319, Cl. 310-36.000.

Nagata, Wataru: *See—*
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,346,218, Cl. 544-16.000.

Nagayama, Haruhiko, to Ricoh Co., Ltd. Multiple charge electrode device for liquid jet printer. 4,346,389, Cl. 346-75.000.

Nagy, Janos: *See—*
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, 4,346,001, Cl. 210-198.300.

Naito, Mitsuaki: *See—*
Goto, Fumio; Yoshino, Kenji; Kono, Hiroshi; and Naito, Mitsuaki, 4,345,852, Cl. 404-114.000.

Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performance tempo control device. 4,345,501, Cl. 84-1.030.

Nakagaki, Kunihiro: *See—*
Saito, Yasunori; Nakagaki, Kunihiro; Yoneyama, Kunihiko; and Ohmoto, Katsumi, 4,346,253, Cl. 174-29.000.

Nakahara, Yutaka: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,346,025, Cl. 524-141.000.

Nakai, Taiichiro; Sato, Masanori; Furusawa, Kahei; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Ejiri, Yoshihiro, to Kokusai Denshin

Denwa Kabushiki Kaisha. Optical fiber introducing equipment for optical submerged repeater. 4,345,816, Cl. 350-96.200.

Nakajima, Kikuo, to Kuniaki Yamazaki. Support bandage. 4,345,590, Cl. 128-166.000.

Nakamoto, Takeshi; Iwaki, Katsutaro; Muto, Katsuya; Itoh, Katsumi; and Akita, Yoshio, to Nippondenso Co., Ltd. Battery charging control system for vehicles. 4,346,338, Cl. 322-28.000.

Nakamura, Kaoru: *See*—
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,345,771, Cl. 277-205.000.

Nakamura, Kotaro: *See*—
Sawada, Satoru; Oono, Shigeru; Seto, Nobuo; Suzuki, Yoshiaki; Nakamura, Kotaro; and Furutachi, Nobuo, 4,346,165, Cl. 430-372.000.

Nakamura, Koyo; and Nagaishi, Hatsuo, to Nissan Motor Co., Ltd. Electronically controlled carburetor. 4,345,560, Cl. 123-440.000.

Nakamura, Kunihiko; and Miyaji, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet transport apparatus. 4,345,752, Cl. 271-12.000.

Nakamura, Nobuo: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Nakamura, Nobuo; Okubo, Shuji; Shirahata, Kunikatsu; Kasai, Masaji; and Oka, Tetsuo, 4,346,075, Cl. 424-120.000.

Nakamura, Toshikazu; and Yoshida, Hirofumi, to Murata Manufacturing Co., Ltd. Heating device employing thermistor with positive coefficient characteristic. 4,346,285, Cl. 219-381.000.

Nakamura, Yayoi: *See*—
Akashi, Kunihiko; Nakamura, Yayoi; Tsuchida, Takayasu; Yoshii, Hiroe; and Ikeda, Shigeho, 4,346,169, Cl. 435-114.000.

Nakamura, Yoshikatsu: *See*—
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,345,942, Cl. 75-237.000.
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,345,943, Cl. 75-238.000.

Nakasu, Kei, to Toyota Jidosha Kogyo Kabushiki Kaisha. Alarm device for a brake clearance limit in an air-over-hydraulic brake system. 4,345,672, Cl. 188-1.110.

Nakasuji, Mamoru; and Wada, Hirotsugu, to VLSI Technology Research Association. Electron gun. 4,346,325, Cl. 313-336.000.

Nakaya, Shunichi; and Araoka, Katsumasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Expansion engine. 4,345,926, Cl. 62-38.000.

Nakayama, Shozo; Hattori, Mitsuhiro; and Ono, Hiromitsu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Rotary compressor with vanes in the housing and suction through the rotor. 4,345,886, Cl. 418-100.000.

Narisada, Masayuki: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,346,218, Cl. 544-16.000.

National Distillers & Chemical Corp.: *See*—
Feldman, Julian, 4,346,241, Cl. 568-916.000.

National Research Development Corporation: *See*—
Bhattacharyya, Sushantha K.; and El-Menshawy, Mohamed F., 4,346,278, Cl. 219-69.00M.
Gilmour, Neil J. L.; Martin, William B.; Sharp, James M.; Thompson, Dennis A.; and Wells, Peter W., 4,346,074, Cl. 424-92.000.
Hiles, Maurice A. F., 4,346,205, Cl. 528-53.000.
Shanks, Ian A., 4,346,378, Cl. 340-754.000.

National Semiconductor Corporation: *See*—
George, Peter K., 4,346,454, Cl. 365-15.000.
Monticelli, Dennis M.; Howard, William M.; and Sleeth, Robert S., 4,346,380, Cl. 340-825.630.
Wilcox, Milton E., 4,346,351, Cl. 331-117.00R.

National Starch and Chemical Corporation: *See*—
Breuninger, William F., 4,345,948, Cl. 127-70.000.
Flanagan, Thomas P., 4,345,349, Cl. 412-5.000.

Natter, Eckard F.: *See*—
Francis, William H.; and Natter, Eckard F., 4,346,386, Cl. 343-765.000.

NCR Corporation: *See*—
Brower, Ronald W., 4,345,366, Cl. 29-571.000.
Carrigan, Donald G., 4,345,365, Cl. 29-571.000.
Coe, Mary Ellen B., 4,345,968, Cl. 156-627.000.
Skaggs, William G.; and Curry, John L., 4,346,379, Cl. 340-778.000.

Neal, Brian P., to Bendix Westinghouse Ltd. Fluid seal element for compressed air filter. 4,345,767, Cl. 277-12.000.

Nedyalkov, Ivan P., to Institute Za Yadreni Izsledvaniya I Yadrena Energetika. Sea and ocean wave energy converter. 4,345,434, Cl. 60-398.000.

Negishi, Takao; and Tomiita, Kazuo, to Toray Industries, Inc. Process for making bulky textured multifilament yarn. 4,345,425, Cl. 57-289.000.

Netstal-Maschinen AG: *See*—
Hemmi, Peter; and Schrepfer, Richard, 4,345,890, Cl. 425-143.000.

Neufeld, Murray J., to Hughes Aircraft Company. Method for controlling the attitude of a spinning spacecraft in the presence of solar pressure. 4,345,728, Cl. 244-168.000.

New England Digital Corp.: *See*—
Alonso, Sydney A.; and Jones, Cameron W., 4,345,500, Cl. 84-1.010.

Newby, Kenneth R.: *See*—
Bellows, Richard J.; Grimes, Patrick G.; Newby, Kenneth R.; Einstein, Harry; and Tsien, Hsue C., 4,346,150, Cl. 429-18.000.

Newman, Don E., to Stretch Devices, Inc. Screen tensioning and printing frame. 4,345,390, Cl. 38-102.910.

Newton, Philip T. Paper roll lifting device. 4,345,788, Cl. 294-1.00R.

Nichols, George M., to Borg-Warner Chemicals, Inc. Flame retardant polypropylene compositions containing trityl synergists. 4,346,187, Cl. 524-83.000.

Nicollet, Henri: *See*—
Danel, Francois; Nicollet, Henri; Marchal, Paul; Robin, Marc; and Vertut, Jean, 4,345,658, Cl. 180-8.00C.

Niedecker, Herbert. Apparatus for transferring sausage hanger loops into a closing machine. 4,345,411, Cl. 53-134.000.

Nigol, Olaf, to Slater Steel Industries Limited. Overhead electrical conductor system including subspan oscillation and aeolian vibration absorber for single and bundle conductors. 4,346,255, Cl. 174-42.000.

Niigata Engineering Co., Ltd.: *See*—
Goto, Fumio; Yoshino, Kenji; Kono, Hiroshi; and Naito, Mitsuaki, 4,345,852, Cl. 404-114.000.

Nims, Dean L. Basketball. 4,345,759, Cl. 273-65.00R.

Nippon Cable System, Inc.: *See*—
Mochida, Haruo; and Kobayashi, Tetsuo, 4,345,863, Cl. 411-252.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,345,501, Cl. 84-1.030.
Yokoyama, Kenji, 4,346,349, Cl. 330-10.000.

Nippon Hodo Co., Ltd.: *See*—
Goto, Fumio; Yoshino, Kenji; Kono, Hiroshi; and Naito, Mitsuaki, 4,345,852, Cl. 404-114.000.

Nippon Kogaku K.K.: *See*—
Takahama, Akio, 4,346,447, Cl. 364-560.000.

Nippon Piston Ring Co., Ltd.: *See*—
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,345,942, Cl. 75-237.000.
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,345,943, Cl. 75-238.000.

Nippon Soda Company Limited: *See*—
Yasuda, Yasushi; Mizuno, Masami; Nishikawa, Hiroaki; and Murakami, Akira, 4,346,098, Cl. 424-273.00R.

Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Mukainakano, Siniti; and Yoshida, Hitoshi, 4,345,569, Cl. 123-549.000.
Kawai, Hisasi; Sakurai, Kazuhiro; and Matsumoto, Muneaki, 4,345,737, Cl. 251-129.000.
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,345,558, Cl. 123-425.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Kanamori, Terutoshi; and Manabe, Toyotaka, 4,346,176, Cl. 501-37.000.
Kawachi, Masao; Tomaru, Satoru; Edahiro, Takao; and Suto, Shoichi, 4,345,928, Cl. 65-18.200.
Ohkoshi, Seiei; Ishikawa, Isao; Okamoto, Teiji; and Tsukamoto, Nobuo, 4,346,472, Cl. 371-37.000.

Nippondenso Co., Ltd.: *See*—
Kojima, Yasuhumi, 4,345,714, Cl. 236-46.00R.
Kondo, Toshio; Sagisaka, Yasuo; Tajima, Masahiko; and Kobayashi, Akio, 4,345,561, Cl. 123-440.000.
Nakamoto, Takeshi; Iwaki, Katsutaro; Muto, Katsuya; Itoh, Katsumi; and Akita, Yoshio, 4,346,338, Cl. 322-28.000.

Nishigawa Shoji Co. Ltd.: *See*—
Kuroda, Minoru, 4,345,958, Cl. 156-221.000.

Nishikawa, Hiroaki: *See*—
Yasuda, Yasushi; Mizuno, Masami; Nishikawa, Hiroaki; and Murakami, Akira, 4,346,098, Cl. 424-273.00R.

Nishikawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Anti-roll system for vehicles. 4,345,661, Cl. 180-141.000.

Nishimura, Akira: *See*—
Osawa, Yoshitaka; Nishimura, Akira; and Toyooka, Shinichi, 4,346,139, Cl. 428-252.000.

Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shunichi; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Process for producing aminoaryl-β-sulfatoethylsulfone. 4,346,046, Cl. 260-458.00C.

Nishio, Katsufumi: *See*—
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,345,517, Cl. 99-511.000.

Nishizawa, Hideyuki. Rinsing and drying apparatus. 4,345,609, Cl. 134-57.00R.

Nissan Motor Company, Limited: *See*—
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,345,571, Cl. 123-568.000.
Ikeura, Kenji, 4,345,557, Cl. 123-339.000.
Kawamura, Yoshihisa; Matsuto, Kesao; and Saito, Masaaki, 4,345,564, Cl. 123-490.000.
Miyamoto, Keiichi; Inoue, Naohiko; and Takeuchi, Yasuhisa, 4,345,522, Cl. 104-89.000.
Mochida, Haruo; and Kobayashi, Tetsuo, 4,345,863, Cl. 411-252.000.
Nakamura, Koyo; and Nagaishi, Hatsuo, 4,345,560, Cl. 123-440.000.
Takagi, Kazumasa; and Tsunoda, Masakazu, 4,346,364, Cl. 340-52.00D.
Tohda, Masayuki; Takao, Hiroshi; and Kimura, Shinji, 4,345,985, Cl. 204-192.0EC.
Yasuhara, Seishi, 4,345,429, Cl. 60-279.000.

Noall, Kenneth L., to Abex Corporation. Wheelchair lift. 4,345,669, Cl. 187-10.000.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel with spool shaft bearings. 4,345,726, Cl. 242-212.000.

Noda, Yoshiteru: *See—*
Ohsawa, Mitsuo; Noda, Yoshiteru; Ichikawa, Iwao; and Yamamoto, Katsumi, 4,345,371, Cl. 29-836.000.

Noe, William B.: *See—*
Riggle, Charles M.; Read, John D.; Noe, William B.; Winfrey, Richard; Pollard, Christopher A.; and Bernett, Frank W., 4,346,416, Cl. 360-106.000.

Nomura, Norimasa; and Yoshimi, Yasuhito, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic film developer having a film guide means. 4,345,832, Cl. 354-320.000.

Nordin, Ivan C.: *See—*
Schweiss, Dietrich; and Nordin, Ivan C., 4,346,097, Cl. 424-273.00P.

Norman, Bo; and Grundstrom, Karl-Johan, to Svenska Traforskningsinstitutet. Method at screening apparatus for cleaning the apertures in a screen plate and device for carrying out the method. 4,346,007, Cl. 210-360.100.

Northern Telecom Limited: *See—*
Cowley, William E.; Shannon, Michael A.; and LeNir, Victor L., 4,345,962, Cl. 156-356.000.

Northwestern University: *See—*
Widder, Kenneth J.; and Senyei, Andrew E., 4,345,588, Cl. 128-1.300.

Nosovsky, Boris I.: *See—*
Gulakov, Sergei V.; Nosovsky, Boris I.; Leschinsky, Leonid K.; Stepnov, Ksenofont K.; and Rudnev, Anatoly E., 4,346,280, Cl. 219-76.100.

Novakovic, Boris Z.: *See—*
Eichenlaub, Rolf; and Novakovic, Boris Z., 4,345,579, Cl. 125-15.000.

NSK-Warner K.K.: *See—*
Morinaga, Masaru, 4,345,723, Cl. 242-107.000.

Numazawa, Akio; Taga, Yutaka; and Funato, Masayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Chain drive assembly. 4,345,904, Cl. 474-215.000.

N.V. Philips' Gloeilampenfabrieken: *See—*
Willems, Leonardus F.; and Vogten, Leonardus L. M., 4,346,262, Cl. 179-1.0SA.

O. A. Newton & Son Company: *See—*
Barlow, Robert C., 4,345,858, Cl. 406-34.000.

Obata, Haruyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Blow-gas treating and controlling system. 4,345,573, Cl. 123-572.000.

Obrist, Albert; and Breuer, Hans, to Albert Obrist AG. Closure cap for a container. 4,345,692, Cl. 215-252.000.

O'Brokta, Ronald D.: *See—*
Lessmann, Gerald G.; Simpson, Ronald P.; and O'Brokta, Ronald D., 4,346,279, Cl. 219-75.000.

Occidental Oil Shale, Inc.: *See—*
McCarthy, Harry E.; French, Gordon B.; and Cook, Melvin A., 4,345,794, Cl. 299-2.000.

Occidental Research Corporation: *See—*
Au, Robert W., 4,346,062, Cl. 423-109.000.

Oce-Andeno B.V.: *See—*
De Heij, Nicolaas A., 4,346,045, Cl. 260-455.00R.

Octanorm-Vertriebs GmbH fur Bauelemente: *See—*
Stenemann, Bruno, 4,345,849, Cl. 403-252.000.

Odaka, Kunihiro: *See—*
Huno, Takakazu; Endo, Takeyuki; Odaka, Kunihiro; and Shibuya, Yasutaka, 4,346,439, Cl. 364-200.000.

Oettinger, Peter E.: *See—*
Lee, Chunghsin; and Oettinger, Peter E., 4,346,330, Cl. 315-150.000.

Ogawa, Hisashi: *See—*
Moriya, Shigeru; Ogawa, Hisashi; and Katsono, Mitsuaki, 4,345,780, Cl. 280-802.000.
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,345,781, Cl. 280-802.000.

Ogawa, Tsuyoshi: *See—*
Imatomi, Eiji; Ogawa, Tsuyoshi; and Hamaoka, Tsutomu, 4,346,167, Cl. 430-569.000.

Ogden, Lynn V.: *See—*
Orthoefer, Frank T.; and Ogden, Lynn V., 4,346,122, Cl. 426-656.000.

Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for recovering fine coal particles from slurry of finely divided coal. 4,346,010, Cl. 210-714.000.

O'Hara, Kevin S., to General Electric Company. Method for making a composite grained cast article. 4,345,950, Cl. 148-2.000.

Ohara, Yuji, to Fuji Photo Film Co., Ltd. Reproducing a color image on a photosensitive material in response to an element-sequential color signal. 4,346,401, Cl. 358-75.000.

Ohhata, Michinobu: *See—*
Yamasawa, Masao; Ohhata, Michinobu; and Ikezawa, Toshi, 4,346,476, Cl. 375-8.000.

Ohkoshi, Seiei; Ishikawa, Isao; Okamoto, Teiji; and Tsukamoto, Nobuo, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Method and apparatus for eliminating double bit errosion in a differential phase shift keying system. 4,346,472, Cl. 371-37.000.

Ohmori, Akira: *See—*
Satokawa, Takaomi; Fujii, Tuneo; Ohmori, Akira; and Fujita, Yorio, 4,346,250, Cl. 568-842.000.

Ohmoto, Katsumi: *See—*
Saito, Yasunori; Nakagaki, Kunihiro; Yoneyama, Kunihiko; and Ohmoto, Katsumi, 4,346,253, Cl. 174-29.000.

Ohomi, Atsushi, to Aisin Seiki Company, Ltd. Vacuum type booster. 4,345,506, Cl. 91-376.00R.

Ohsawa, Mitsuo; Noda, Yoshiteru; Ichikawa, Iwao; and Yamamoto, Katsumi, to Sony Corporation. Method and apparatus for manufacturing hybrid integrated circuits. 4,345,371, Cl. 29-836.000.

Oishi, Hisao: *See—*
Ikeda, Hironosuke; Oishi, Hisao; and Yoshida, Seiki, 4,345,611, Cl. 137-68.00R.

Ojevich, Ted: *See—*
Carter, Harry D.; and Ojevich, Ted, 4,346,370, Cl. 340-384.00E.

Oka, Tetsuo: *See—*
Tomita, Fusao; Tamaoki, Tatsuya; Nakamura, Nobuo; Okubo, Shuji; Shirahata, Kunikatsu; Kasai, Masaji; and Oka, Tetsuo, 4,346,075, Cl. 424-120.000.

Okada, Takanori: *See—*
Tanouchi, Tadao; Kawamura, Masanori; Okada, Takanori; and Hayashi, Masaki, 4,346,099, Cl. 424-273.00R.

Okada, Takashi: *See—*
Akutagawa, Touru; Okada, Takashi; and Tanaka, Yutaka, 4,346,399, Cl. 358-29.000.

Okamoto, Eisaku: *See—*
Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,345,501, Cl. 84-1.030.

Okamoto, Teiji: *See—*
Ohkoshi, Seiei; Ishikawa, Isao; Okamoto, Teiji; and Tsukamoto, Nobuo, 4,346,472, Cl. 371-37.000.

Okamura Oil Mill Limited: *See—*
Sonoda, Noboru; Murai, Shinji; and Takii, Kazuhisa, 4,346,235, Cl. 562-596.000.

Okubo, Shuji: *See—*
Tomita, Fusao; Tamaoki, Tatsuya; Nakamura, Nobuo; Okubo, Shuji; Shirahata, Kunikatsu; Kasai, Masaji; and Oka, Tetsuo, 4,346,075, Cl. 424-120.000.

Okui, Haruki: *See—*
Anno, Nobuo; Okui, Haruki; Yamamoto, Kuniyuki; and Miyazaki, Kunio, 4,345,664, Cl. 180-230.000.

Olesen, Henry T. Power transmission having a continuously variable gear ratio. 4,345,486, Cl. 74-198.000.

Olympus Optical Co., Ltd.: *See—*
Ichikawa, Hiroki, 4,345,354, Cl. 16-257.000.
Kato, Toshikazu, 4,345,725, Cl. 242-204.000.
Osanai, Akira, 4,346,414, Cl. 360-90.000.
Sakurada, Masahiko, 4,346,056, Cl. 422-64.000.
Tomabechi, Hideo; Osada, Hazime; and Osanai, Akira, 4,346,415, Cl. 360-105.000.

Omron Tateisi Electronics Co.: *See—*
Iwakiri, Norio; and Kiyono, Yasuhiro, 4,346,275, Cl. 200-314.000.

O'Neil, Joseph H.: *See—*
Armstrong, John C.; and O'Neil, Joseph H., 4,345,716, Cl. 239-56.000.

Ono, Hiromitsu: *See—*
Nakayama, Shozo; Hattori, Mitsuhiro; and Ono, Hiromitsu, 4,345,886, Cl. 418-100.000.

Ono Pharmaceutical Co., Ltd.: *See—*
Tanouchi, Tadao; Kawamura, Masanori; Okada, Takanori; and Hayashi, Masaki, 4,346,099, Cl. 424-273.00R.

Oono, Shigeru: *See—*
Sawada, Satoru; Oono, Shigeru; Seto, Nobuo; Suzuki, Yoshiaki; Nakamura, Kotaro; and Furutachi, Nobuo, 4,346,165, Cl. 430-372.000.

Oosterling, Pieter A.; and van Staveren, Hendricus C., to Multinorm, B.V. Mowing implement. 4,345,420, Cl. 56-295.000.

Ootsuka, Yoshinori: *See—*
Yamaguchi, Hiroaki; Hattori, Tadashi; and Ootsuka, Yoshinori, 4,345,558, Cl. 123-425.000.

Ooyachi, Akio: *See—*
Iiyama, Shigeru; Otsu, Sinzi; and Ooyachi, Akio, 4,345,966, Cl. 156-523.000.

Oppel, Werner: *See—*
Herter, Martin, deceased; Herter, Johanna, heiress; Radtke, Ingrid, heir; Herter, Manfred, heir; and Oppel, Werner, 4,345,610, Cl. 137-7.000.

Optimetrix Corporation: *See—*
Phillips, Edward H., 4,345,836, Cl. 355-53.000.

Optiz, Heinrich: *See—*
Montag, Bernhard; and Optiz, Heinrich, 4,346,166, Cl. 430-435.000.

Orgatechna Treuhand AG: *See—*
Gutschmidt, Peter-Michel, 4,345,530, Cl. 110-215.000.

Orihara, Shobu: *See—*
Kinoshita, Ryoichi; and Orihara, Shobu, 4,346,456, Cl. 365-36.000.

Orthoefer, Frank T.; and Ogden, Lynn V., to A. E. Staley Manufacturing Company. Low-viscosity, high-NSI, heat-gelling soy isolates. 4,346,122, Cl. 426-656.000.

Osada, Hazime: *See—*
Tomabechi, Hideo; Osada, Hazime; and Osanai, Akira, 4,346,415, Cl. 360-105.000.

Osaka City Government: *See—*
Yoshimura, Hidenaga; Yamada, Kunio; Yamada, Hironori; Yamada, Ryusaku; and Kudo, Hiroaki, 4,345,602, Cl. 128-349.00R.

Osanai, Akira, to Olympus Optical Co., Ltd. Tape recorder. 4,346,414, Cl. 360-90.000.

Osanai, Akira: *See—*
Tomabechi, Hideo; Osada, Hazime; and Osanai, Akira, 4,346,415, Cl. 360-105.000.

Osawa, Yoshitaka; Nishimura, Akira; and Toyooka, Shinichi, to Sumitomo Electric Industries, Ltd. Highly weather-proof high

strength tri-axial woven membrane materials. 4,346,139, Cl. 428-252.000.

Osborn Manufacturing Corporation, The: *See—*
Hermes, Rudolf, 4,345,638, Cl. 164-456.000.

Oshima, Yujiro; Fujitani, Yoshiyasu; Muraki, Hideaki; Kondoh, Shiroh; and Yokota, Kouji, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Self-heating ignition plug. 4,345,555, Cl. 123-272.000.

Ostlund, Artur: *See—*
Lofgren, Lars; and Ostlund, Artur, 4,346,054, Cl. 422-49.000.

Ota, Yoshihiko, to Victor Company of Japan, Ltd. Apparatus for reproducing a video signal of one system with conversion to a video signal of another system. 4,346,397, Cl. 358-4.000.

Otsu, Sinzi: *See—*
Iiyama, Shigeru; Otsu, Sinzi; and Ooyachi, Akio, 4,345,966, Cl. 156-523.000.

Ott, Helmut: *See—*
Ruchser, Erich; Ott, Helmut; and Baldauf, Gunter, 4,345,620, Cl. 137-596.160.

Ouchi, Hirobumi, to Hitachi, Ltd. Light detecting photodiode-MIS transistor device. 4,346,395, Cl. 357-30.000.

Oude Alink, Bernardus A., to Petrolite Corporation. Preparation of perhydrophenanthridines. 4,346,223, Cl. 546-18.000.

Ouellette, Paul J.: *See—*
Gutbier, Ernst A.; and Ouellette, Paul J., 4,345,814, Cl. 339-275.00R.

Ovshinsky, Stanford R.; Klose, Peter H.; and Messing, Wayne P., to Energy Conversion Devices, Inc. Data storage and retrieval system. 4,346,449, Cl. 364-900.000.

Owatonna Manufacturing Company, Inc.: *See—*
Schwalenberg, Terry R.; Krumholz, Frank C.; Kanengieter, Glenn G.; and Henkensiefken, Larry L., 4,345,421, Cl. 56-341.000.

Owens-Corning Fiberglas Corporation: *See—*
Wong, Robert W.; and Haines, Richard M., 4,346,026, Cl. 524-157.000.

Ozawa, Jun: *See—*
Endo, Fumihiro; Ishikawa, Toshio; Ozawa, Jun; Kamata, Yuzuru; and Shiono, Shigeo, 4,345,471, Cl. 374-188.000.

Ozeki, Kenichi; and Fushimi, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Exhaust fan with protective band. 4,345,874, Cl. 415-9.000.

P.H.D. of Puerto Rico, Inc.: *See—*
Hubbard, Leo J., 4,345,708, Cl. 226-74.000.

Pacesetter Systems, Inc.: *See—*
Schulman, Joseph H., 4,345,603, Cl. 128-419.0PT.

Padias, Anne B.: *See—*
Hall, Henry K., Jr.; and Padias, Anne B., 4,346,213, Cl. 528-272.000.

Pagnozzi, Ernesto G.: *See—*
Pagnozzi, Vincenzo; and Pagnozzi, Ernesto G., 4,345,384, Cl. 34-16.500.

Pagnozzi, Vincenzo; and Pagnozzi, Ernesto G. Process for drying wood. 4,345,384, Cl. 34-16.500.

Pai, Damodar M.; Stolka, Milan; and Yanus, John F., to Xerox Corporation. Imaging system with a diamine charge transport material in a polycarbonate resin. 4,346,158, Cl. 430-59.000.

Paine, Harold L.: *See—*
Park, Hung S.; Ryan, William D., Jr.; and Paine, Harold L., 4,345,949, Cl. 134-22.160.

Pako Corporation: *See—*
Willenbring, Armer J., 4,345,754, Cl. 271-209.000.

Paletta, Benno; Moller, Reinhard; and Kasielke, Joachim, to Clinicon International GmbH. Metering apparatus. 4,345,483, Cl. 73-864.160.

Palfreyman, Michael G.; and McDonald, Ian A., to Merrell Toraude et Compagnie. Method for treating depression. 4,346,110, Cl. 424-319.000.

Palitex Project Company GmbH: *See—*
Leupers, Wolfgang, 4,345,423, Cl. 57-58.840.

Palkes, Mark: *See—*
Wysk, Stanley R.; and Palkes, Mark, 4,346,316, Cl. 310-11.000.

Pallo, John M.; Previte, Stephen J.; and Schafer, William, to Manville Service Corporation. Automotive catalytic converter exhaust system. 4,345,430, Cl. 60-282.000.

Palmatier, Roland T.: *See—*
Erbstein, Robert S.; Richard, Gary R.; Palmatier, Roland T.; and McGill, Robert W., 4,346,446, Cl. 364-551.000.

Palmer, Keith W.: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,346,021, Cl. 252-431.00N.

Pamplin, John W.; Astbury, Brian R.; and Shillito, Richard, to Marshall Richards Barcro Limited. Wire drawing method and apparatus. 4,345,451, Cl. 72-286.000.

Panchu, Paul, to Polaroid Corporation. Method of making laminates. 4,345,954, Cl. 156-87.000.

Park, Hung S.; Ryan, William D., Jr.; and Paine, Harold L., to B. F. Goodrich Company, The. Cleaning reactors contaminated with carboxyl containing polymers. 4,345,949, Cl. 134-22.160.

Passaro, Robert E.; and Williams, Kevin, to Andros Analyzers Incorporated. Non-dispersive infrared gas analyzer. 4,346,296, Cl. 250-343.000.

Patel, Vishnu A.: *See—*
Eagle, Raymond S.; and Patel, Vishnu A., 4,346,060, Cl. 422-148.000.

Patenaude, Raymond A.; Duke, Steven R.; and Coolidge, John K., to General Electric Company. Firing pin locking system. 4,345,505, Cl. 89-154.000.

Patmore, James R.: *See—*
Wilson, Wayne; Rosko, George; and Patmore, James R., 4,345,463, Cl. 73-190.0CV.

Patterson, James W.: *See—*
Mills, Walter C.; and Patterson, James W., 4,345,613, Cl. 137-317.000.

Paul Masson, Inc.: *See—*
Lunt, James W., 4,345,511, Cl. 99-276.000.

Peacock, Donald G.: *See—*
Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, 4,345,957, Cl. 156-218.000.

Pearl, David R., to Gerber Garment Technology, Inc. Apparatus for working on successive segments of sheet material. 4,345,496, Cl. 83-100.000.

Pechiney Ugine Kuhlmann: *See—*
Morin, Claude, 4,345,583, Cl. 126-427.000.

Pedersen, Poul H. H.: *See—*
Karlberg, Niels G.; and Pedersen, Poul H. H., 4,345,614, Cl. 137-340.000.

Peerless Pump Division, Indian Head Inc.: *See—*
Longiny, Michael A.; Kalchev, Dimitar; and Zinn, Thomas K., 4,345,884, Cl. 417-359.000.

Pegasus Pension Fund S.A.: *See—*
Giovannetti, Giusto, 4,345,403, Cl. 47-1.100.

Pehl, Willis G.: *See—*
Bockwinkel, Joe L.; and Pehl, Willis G., 4,345,630, Cl. 144-346.000.

Pellus, Gilbert: *See—*
Blanc, Jacques; Coulon, Andre; and Pellus, Gilbert, 4,345,977, Cl. 204-26.000.

Peng, Fred M.; and Tokas, Edward F., to Monsanto Company. Process for a polymeric polyblend composition comprising a matrix phase terpolymer of alkenyl aromatic alkenyl nitrile and myrcene monomers and a diene rubber phase grafted with said monomers. 4,346,199, Cl. 525-316.000.

Pennwalt Corporation: *See—*
Piucci, Joseph A.; and Goltz, Kurt, 4,346,014, Cl. 252-47.500.

Penque, Leonard M.: *See—*
Soderberg, John H.; and Penque, Leonard M., 4,345,521, Cl. 101-93.000.

Perego, Giuseppe. Babys' pushchairs, of type collapsing widthaways and easy to carry by hand like an umbrella, plus relative improved pushchair. 4,345,777, Cl. 280-647.000.

Peresunko, Stanislav R.: *See—*
Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.

Perkin-Elmer Corporation, The: *See—*
Loveland, Robert S., 4,345,479, Cl. 73-861.280.

Pernicka, Martin: *See—*
Gadoury, Andre; Pinheiro, Victor; and Pernicka, Martin, 4,345,344, Cl. 5-62.000.

Perrone, Francesco: *See—*
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,346,443, Cl. 364-431.040.

Perrucci, Joseph W.: *See—*
Goldsmith, Norman; and Perrucci, Joseph W., 4,345,520, Cl. 100-293.000.

Perry, Ralph A.; and Booe, James M., to Emhart Industries, Inc. Sensing device. 4,345,459, Cl. 73-61.10R.

Peschl, Ivan A. S. Z. Universal blending method for blending the material contents of a silo. 4,345,842, Cl. 366-137.000.

Peter, Siegfried; Brunner, Gerd; and Riha, Rolf, to Peter, Siegfried. Process for separating mixtures of substances of low volatility. 4,345,976, Cl. 203-49.000.

Peterlein, Karl: *See—*
Schulde, Felix; Peterlein, Karl; and Diedrich, Klaus, 4,346,204, Cl. 526-271.000.

Peters, John W.: *See—*
Braund, Darwin G.; Fronk, Thomas J.; Goings, Richard L.; Peters, John W.; and Steele, Robert L., 4,346,077, Cl. 424-156.000.

Petersson, Ralf K. E., deceased; and by Vejdemo, Stephan, executor, to Sundins Fabriker AB. Close-off valve for suction pipes in hydraulic pumps. 4,345,881, Cl. 417-270.000.

Petkidis, Dmetrios. Method of and apparatus for manufacturing plowshares. 4,345,358, Cl. 29-14.000.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A., 4,346,223, Cl. 546-18.000.
Quinlan, Patrick M., 4,346,217, Cl. 542-412.000.

Pettingill, Lucius A., Jr. Tube marking device and gage. 4,345,379, Cl. 33-21.00R.

Petzinger, Manfred W. A. Waterless vacuum toilet. 4,346,002, Cl. 210-202.000.

Pez, Guido P.: *See—*
Grey, Roger A.; and Pez, Guido P., 4,346,240, Cl. 568-842.000.

Pfeffer, George B., to Datafile Limited. Conveyor for labelling apparatus. 4,345,683, Cl. 198-653.000.

Pfeiffer, Ronald E., to American Cyanamid Company. Process for melt-spinning hollow fibers. 4,346,053, Cl. 264-561.000.

Pharmasol Corporation, The: *See—*
Armstrong, John C.; and O'Neil, Joseph H., 4,345,716, Cl. 239-56.000.

Philip Morris Incorporated: *See—*
Grollimund, Everett C.; and Martin, Peter, 4,346,284, Cl. 219-121.0LK.

Robbins, William E.: *See*—
Thompson, Malcolm J.; Mandava, Nagabhushanam; Worley, Joseph F., deceased; Meudt, Werner J.; Dutky, Samson R.; Robbins, William E.; and Flippen-Anderson, Judith L., 4,346,226, Cl. 549-268.000.

Robert Bosch GmbH: *See*—
Drews, Ulrich; Werner, Peter; and Mohrle, Werner, 4,345,562, Cl. 123-440.000.
Eheim, Franz, 4,345,563, Cl. 123-458.000.
Frister, Manfred, 4,346,321, Cl. 310-232.000.
Gruner, Heiko; and Friedrich, Heinz, 4,345,465, Cl. 73-204.000.
Kuttner, Thomas; and Wessel, Wolf, 4,345,559, Cl. 123-435.000.
Massmann, Volker, 4,346,408, Cl. 358-214.000.
Muller, Alfred; Schwab, Manfred; Feder, Meinrad; Schreiber, Achim; and Sauer, Joseph, 4,345,489, Cl. 74-752.00A.

Roberts, David: *See*—
Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, 4,345,957, Cl. 156-218.000.

Roberts, Eugene L., to United States of America, Army. Switched delay line for steerable null antenna system. 4,346,315, Cl. 307-603.000.

Robertshaw Controls Company: *See*—
Bauer, Werner R.; and Smith, William N., 4,345,369, Cl. 29-622.000.

Robertson, David H. Railway car stabilizer. 4,345,523, Cl. 105-1.00A.

Robertson, Harry G., to Edsco, Inc. Hopper discharge valve. 4,345,859, Cl. 406-128.000.

Robertson Paper Box Co., Inc.: *See*—
Davidson, Thomas L., 4,345,687, Cl. 206-418.000.

Robin, Marc: *See*—
Danel, Francois; Nicollet, Henri; Marchal, Paul; Robin, Marc; and Vertut, Jean, 4,345,658, Cl. 180-8.00C.

Robinet, Jules P.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,345,693, Cl. 220-3.300.

Robinson, Glenn N., to International Minerals & Chemical Corp. Method for dispersing comminuted solids. 4,345,945, Cl. 106-300.000.

Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., to Coal Industry (Patents) Limited. Phenanthrene/HCHO derived polyamide-imide. 4,346,212, Cl. 528-229.000.

Robinson, William P.; and Seliger, Robert L., to Hughes Aircraft Company. Ion implantation system. 4,346,301, Cl. 250-492.200.

Rockwell International Corporation: *See*—
Carollo, James A., 4,346,342, Cl. 323-276.000.
Chen, Thomas T., 4,346,455, Cl. 365-16.000.

Rodet, Georges: *See*—
Foucras, Jacques; and Rodet, Georges, 4,346,004, Cl. 210-232.000.

Roehl, Ernst-Ludwig, to Naarden International N.V. Solid antiperspirant composition and process for its preparation. 4,346,079, Cl. 424-65.000.

Roeth, Manfred: *See*—
Wegele, Gunther; Brink, Gerhard; Rotta, Goetz; Roeth, Manfred; and Wittmann, Siegfried, 4,345,907, Cl. 8-444.000.

Rogora, Edoardo: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,346,443, Cl. 364-431.040.

Rohm and Haas Company: *See*—
Fujimoto, Ted T., 4,345,934, Cl. 71-92.000.

Rohr Industries, Inc.: *See*—
Schneider, Samuel; and Beyer, John D., 4,346,444, Cl. 364-475.000.

Rojo, Juana E.: *See*—
Tu, Hosheng; and Rojo, Juana E., 4,345,946, Cl. 127-46.300.

Rolland, Guy, to Societe Mecanique Generale et Decolletage Tournage. Accumulator conveyor. 4,345,684, Cl. 198-781.000.

Rolls-Royce Limited: *See*—
Bunyan, Clive N., 4,345,699, Cl. 222-40.000.
Crofts, Brian, 4,345,799, Cl. 308-187.000.

Romagnoli, Mario, to Metaux Precieux S.A. Dental prosthesis connecting apparatus. 4,345,901, Cl. 433-172.000.

Romp, Frederick J., to Canargo International Pty. Ltd. Temperature controlled electrical power supply apparatus. 4,346,286, Cl. 219-501.000.

Roque, Claude, to Institut Francais du Petrole. Process for improving the permeability of ground formations, adapted to the production of high temperature geothermic energy. 4,345,652, Cl. 166-307.000.

Roquette Freres: *See*—
Verwaerde, Francoise; Leleu, Jean-Bernard; and Huchette, Michel, 4,346,116, Cl. 426-48.000.

Rose, Levi L.: *See*—
Hestad, Alfred M.; and Rose, Levi L., 4,346,261, Cl. 179-1.0HF.

Rosen, Jonathan J., to Vascor, Inc. Stent for mitral/tricuspid heart valve. 4,345,340, Cl. 3-1.500.

Rosenthal, Arnold J.: *See*—
Forschirm, Alex S.; and Rosenthal, Arnold J., 4,346,209, Cl. 528-191.000.

Rosko, George: *See*—
Wilson, Wayne; Rosko, George; and Patmore, James R., 4,345,463, Cl. 73-190.0CV.

Ross, Abraham D. Sailboat trimming and stabilizing system. 4,345,535, Cl. 114-122.000.

Ross, Carl H.: *See*—
Friebe, Walter-Gunar; Michel, Helmut; Ross, Carl H.; Wiedemann, Fritz; Bartsch, Wolfgang; and Dietmann, Karl, 4,346,093, Cl. 424-269.000.

Ross, Frank L. Method for the production of sawblades, especially jigsaw or sabresaw blades. 4,345,499, Cl. 83-835.000.

Ross, Louis, to Borg-Warner Corporation. Vacuum deaerator. 4,345,920, Cl. 55-46.000.

Rossi, Jean-Paul: *See*—
Clement, Philippe; and Rossi, Jean-Paul, 4,346,115, Cl. 426-25.000.

Rossi, Mario. Device for the recognition and progressive cancellation of information recorded on a magnetic support. 4,346,290, Cl. 235-436.000.

Roth, Zdenek: *See*—
Altman, Josef; and Roth, Zdenek, 4,345,618, Cl. 137-393.000.

Rothenhaus, Robert: *See*—
Blissett, Kitson; and Dunbar, Robert A., 4,346,427, Cl. 361-173.000.

Rothfuss, Robert G., to Senco Products, Inc. Purse-stringer. 4,345,600, Cl. 128-334.00R.

Rothwell, Thomas F.; and Smith, Gerald B., to Dresser Industries, Inc. Corrosion resistant valve construction. 4,345,961, Cl. 156-294.000.

Rotta, Goetz: *See*—
Wegele, Gunther; Brink, Gerhard; Rotta, Goetz; Roeth, Manfred; and Wittmann, Siegfried, 4,345,907, Cl. 8-444.000.

Rougeot, Henri: *See*—
Driard, Bertrand; Ricodeau, Jean; and Rougeot, Henri, 4,346,326, Cl. 313-388.000.

Roura, Miguel J., to Du Pont de Nemours, E. I., and Company. Toughened polyamide blends. 4,346,194, Cl. 525-66.000.

Roussin, Michael A., to Caterpillar Tractor Co. Self pumping seal for a reciprocating member. 4,345,768, Cl. 277-22.000.

Routt, Wilson M., Jr.; and West, Donald L., to International Business Machines Corporation. Coaxial optical scanner. 4,346,292, Cl. 250-216.000.

Rouyer, Robert M. L.: *See*—
Royer, Alain L. A.; Herzog, Eugene; and Rouyer, Robert M. L., 4,345,952, Cl. 148-3.000.

Rowe, Douglas M.: *See*—
Abernathy, Randolph, Jr.; and Rowe, Douglas M., 4,345,896, Cl. 432-19.000.

Rowe, Lacy A. Sealing means for gutter hanger fastening means. 4,345,731, Cl. 248-48.200.

Royer, Alain L. A.; Herzog, Eugene; and Rouyer, Robert M. L., to Pont-A-Mousson S.A. Method for the manufacture of tubes from steel having high ductility at low temperature. 4,345,952, Cl. 148-3.000.

Royer, George R. Solar energy system. 4,345,584, Cl. 126-427.000.

Ruchser, Erich; Ott, Helmut; and Baldauf, Gunter, to Technomatic AG. Safety valve assembly. 4,345,620, Cl. 137-596.160.

Rudnev, Anatoly E.: *See*—
Gulakov, Sergei V.; Nosovsky, Boris I.; Leschinsky, Leonid K.; Stepnov, Ksenofont K.; and Rudnev, Anatoly E., 4,346,280, Cl. 219-76.100.

Rued, Glen A.: *See*—
Simpson, Elmer J.; and Rued, Glen A., 4,345,507, Cl. 91-449.000.

Ruffolo, James C.: *See*—
Blout, Bennett O.; and Ruffolo, James C., 4,345,862, Cl. 410-134.000.

Ruhrchemie AG: *See*—
Bach, Hanswilhelm; Brundin, Eike; and Gick, Wilhelm, 4,346,239, Cl. 568-461.000.
Berzen, Josef; and Mrozik, Herbert, 4,345,656, Cl. 173-131.000.

Rundell, John T.; Pottage, Paul R.; and Harradine, Ronald J., to Tate & Lyle Limited. Clarification of glucose syrups. 4,345,947, Cl. 127-48.000.

Runyon, Clinton A. Interchangeable tone chamber. 4,345,503, Cl. 84-383.00R.

Russo, Vera: *See*—
Righini, Giancarlo; Sottini, Stefano; and Russo, Vera, 4,345,815, Cl. 350-96.180.

Rutledge, Robert W., to Phillips Petroleum Company. Process control. 4,346,433, Cl. 364-162.000.

Ruvolo, Antonio; and Massa, Vincenzo, to Montedison S.p.A. Process for preparing absorbing mop material of non-woven fibres and polymeric binder. 4,346,127, Cl. 427-244.000.

Ryabchenjuk, Leonid M.: *See*—
Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.

Ryan, Douglas G.: *See*—
Leighton, Milton D.; and Ryan, Douglas G., 4,346,008, Cl. 210-395.000.

Ryan, William D., Jr.: *See*—
Park, Yung S.; Ryan, William D., Jr.; and Paine, Harold L., 4,345,949, Cl. 134-22.160.

Rybalko, Sergei A. Electron beam device with variable beam energy. 4,346,328, Cl. 313-449.000.

Ryska, Antonin: *See*—
Zobac, Ladislav; Malek, Zdenek; Soukup, Frantisek; Ryska, Antonin; Jelinek, Jan; and Busta, Jiri, 4,345,598, Cl. 128-303.100.

S & C Electric Company: *See*—
Zulaski, John A., 4,346,307, Cl. 307-130.000.

Sabino, Mario C. Vertical can crusher. 4,345,519, Cl. 100-215.000.

Sadamatsu, Shigeru; Pu, Lyon S.; and Ishikawa, Yoshihisa, to Fuji Xerox Co., Ltd. Photosensitive element for electrophotography. 4,346,159, Cl. 430-67.000.

Saerens, Jean: *See*—
Rigal, Michel; and Saerens, Jean, 4,346,153, Cl. 429-234.000.

Safe S.r.l.: *See*—
Zanarini, Franco, 4,345,880, Cl. 417-264.000.

Saggers, David T.: *See*—
Gates, Peter S.; Gillon, John; and Saggers, David T., 4,345,932, Cl. 71-88.000.
Sagisaka, Yasuo: *See*—
Kondo, Toshio; Sagisaka, Yasuo; Tajima, Masahiko; and Kobayashi, Akio, 4,345,561, Cl. 123-440.000.
St. Clair, Roger L.: *See*—
Thibault, Thomas D.; and St. Clair, Roger L., 4,345,936, Cl. 71-92.000.
St. John, Michael R.: *See*—
Sammells, Anthony F.; and St. John, Michael R., 4,346,152, Cl. 429-112.000.
Saito, Fumitoshi; Maeda, Sotomitsu; and Uetsuji, Toshio, to Matsushita Electric Industrial Company, Limited; and Matsushita Reiki Company, Limited. Hermetic motor compressor. 4,345,882, Cl. 417-312.000.
Saito, Masaaki: *See*—
Kawamura, Yoshihisa; Matsuto, Kesao; and Saito, Masaaki, 4,345,564, Cl. 123-490.000.
Saito, Shuichi, to Kimura Bed Mfg. Company Limited. Vacuum suction type urinating aid. 4,345,341, Cl. 4-301.000.
Saito, Shuiichi, to Kimura Bed Mfg. Company Limited. Vacuum suction type urinating aid. 4,345,342, Cl. 4-301.000.
Saito, Yasunori; Nakagaki, Kunihiro; Yoneyama, Kunihiko; and Ohmoto, Katsumi, to Sumitomo Electric Industries, Ltd. Coaxial cable. 4,346,253, Cl. 174-29.000.
Sakai, Shinji: *See*—
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Hedgren, Erland, 4,345,591, Cl. 128-169.000.
Sammells, Anthony F.; and St. John, Michael R., to Institute of Gas Technology. Lithium-germanium electrodes for batteries. 4,346,152, Cl. 429-112.000.
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Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,346,243, Cl. 568-591.000.
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Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,345,385, Cl. 34-23.000.
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Gurr, George P., 4,346,421, Cl. 361-57.000.
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Takiguchi, Yo; Mishima, Hiroshi; Yamamoto, Shinjiro; and Terao, Michiya, 4,346,171, Cl. 435-119.000.
Terahara, Akira; and Tanaka, Minoru, 4,346,227, Cl. 560-119.000.
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Uyeda, Stanley T.; Radu, E. John; Talbot, William J., Jr.; and Feldman, Norman, 4,345,855, Cl. 405-168.000.
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Ikeda, Hironosuke; Oishi, Hisao; and Yoshida, Seiki, 4,345,611, Cl. 137-68.00R.
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Contreras, Joseph P.; and Sass, George J., 4,345,607, Cl. 132-83.00R.
Sato, Kouji; Takahashi, Sadao; and Kodama, Toshikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Elastic surface wave device. 4,346,322, Cl. 310-313.00B.
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Sato, Yuji; and Koizumi, Shoji, to Furuno Electric Co., Ltd. Recorder. 4,346,391, Cl. 346-136.000.
Satokawa, Takaomi; Fujii, Tuneo; Ohmori, Akira; and Fujita, Yorio, to Daikin Kogyo Co., Ltd. Telomerization of tetrafluoroethylene. 4,346,250, Cl. 568-842.000.
Sattler, Henning; and Ulex, Georg A., to Beiersdorf Aktiengesellschaft. Corticosteroid-containing cream. 4,346,086, Cl. 424-243.000.
Sauer, George E., to General Electric Company. Cooling duct arrangement for transformer windings. 4,346,361, Cl. 336-60.000.
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McCranie, Stephen C.; and Houseman, Andrew J., 4,345,413, Cl. 53-315.000.
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Sawada, Satoru; Oono, Shigeru; Seto, Nobuo; Suzuki, Yoshiaki; Nakamura, Kotaro; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Process for improving light fastness of color images. 4,346,165, Cl. 430-372.000.
Schaberle, Erwin, to Sulzer Morat GmbH. Circular knitting machine for producing high pile fabric having combed-in fibres. 4,345,446, Cl. 66-9.00B.
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Spengler, Emerson D.; and Schaeffer, Charles W., 4,345,492, Cl. 76-101.00R.
Schafer, William: *See*—
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Scharbert, W. Donald: *See*—
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Schardt, James J., to Dayton Wheel Products Company. Wire wheel with disc brake clearance. 4,345,795, Cl. 301-6.00E.
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Schedrat, Gunther: *See*—
Schmidt, Adolf; Meier, Helmut; Schedrat, Gunther; and Bockmann, August, 4,346,203, Cl. 526-225.000.
Scheibitz, Wolfgang: *See*—
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Krull, Walther; Kohn, Dieter; and Schiller, Wolf-Dieter, 4,345,623, Cl. 137-637.200.
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Schlumberger Technology Corporation: *See*—
Schuster, Nick A., 4,346,460, Cl. 367-27.000.
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deBuhr, Harold E.; Booker, Walter W.; and Schmid, Steven L., 4,345,417, Cl. 56-14.300.
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Schmidt, Robert C. H. Aiming post light. 4,346,329, Cl. 315-51.000.
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Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,346,080, Cl. 424-84.000.
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Schneider, Louis; and Graham, David E., to GAF Corporation. Herbicidal N-(haloacetyl)-N-(N'-methylenepyrrolidonyl)-2-alkoxyanilines. 4,345,937, Cl. 71-95.000.
Schneider, Samuel; and Beyer, John D., to Rohr Industries, Inc. Constant thrust adaptive control machine tool. 4,346,444, Cl. 364-475.000.
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Katz, Harry S.; and Schneider, Sidney, 4,345,900, Cl. 433-171.000.
Schoen, Donald W., to Donaldson Company, Inc. Air purifier with hermetic sealing. 4,345,923, Cl. 55-314.000.

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Schrepfer, Richard: *See*—
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Schroeder, Donald E.; and Temperly, Thomas, to Inryco, Inc. Brace member and wall structure. 4,345,409, Cl. 52-693.000.
Schroyer, Kenneth, to Instruments, Computers and Controls Corp. Digital torque meter system. 4,345,481, Cl. 73-862.340.
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Handschuch, Karl; Wulfhorst, Burkhard; and Gilhaus, Konrad, 4,345,356, Cl. 19-200.000.
Hauner, Friedrich, 4,345,542, Cl. 118-78.000.
Schulde, Felix; Peterlein, Karl; and Diedrich, Klaus, to C Hemische Werke Huls Aktiengesellschaft. Copolymers containing hydroxyl groups, method of production and their application in sizing of paper. 4,346,204, Cl. 526-271.000.
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Schuster, Nick A., to Schlumberger Technology Corporation. Method and apparatus for deriving compensated measurements in a borehole. 4,346,460, Cl. 367-27.000.
Schwab, Manfred: *See*—
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Schwalenberg, Terry R.; Krumholz, Frank C.; Kanengieter, Glenn G.; and Henkensiefken, Larry L., to Owatonna Manufacturing Company, Inc. Baling machine with a non-circular chamber. 4,345,421, Cl. 56-341.000.
Schwarz, Alois; Mautz, Karl-Heinz; and Stephan, Michael, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Rotor structure for a rotary wing aircraft. 4,345,876, Cl. 416-134.00A.
Schweiss, Dietrich; and Nordin, Ivan C., to Warner-Lambert Company. Method for treating convulsions with pyrazole-4-carboxamide derivatives. 4,346,097, Cl. 424-273.00P.
Scope Incorporated: *See*—
Drapeau, Raoul E.; and Stone, William M., 4,346,453, Cl. 364-900.000.
Scorso, Clifford A., Jr.: *See*—
Leuenberger, Jean P.; Logan, David J.; and Scorso, Clifford A., Jr., 4,346,445, Cl. 364-520.000.
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SECO Industries, Inc.: *See*—
Moss, Theron C.; Boring, Earl; and Hjellum, Jerry, 4,345,351, Cl. 15-144.00B.
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Mayumi, Masakatsu; Mitooka, Kenji; and Fujiwara, Sigeharu, 4,345,625, Cl. 138-141.000.
Seliger, Robert L.: *See*—
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Sanjiki, Tetsutaro; Seta, Akinori; and Kiyohara, Takao, 4,346,096, Cl. 424-273.00R.
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Severson, Eugene K., to Hewlett-Packard Company. DC Switching circuit with current through resistive load below holding current of triac strings to charge capacitive load to predetermined potentials. 4,346,308, Cl. 307-252.00B.
Shabe, John: *See*—
Alvarez, Joseph A., III; and Shabe, John, 4,346,470, Cl. 370-104.000.
Shacher, Sraya, to Solmat Systems Ltd. Bottom construction of ponds particularly solar ponds. 4,345,581, Cl. 126-415.000.
Shah, Dilip: *See*—
Kopp, Clinton V.; and Shah, Dilip, 4,346,006, Cl. 210-321.400.
Shakertown Corporation: *See*—
Bockwinkel, Joe L.; and Pehl, Willis G., 4,345,630, Cl. 144-346.000.
Shaltis, Robert J.: *See*—
Alexander, Willis R.; and Shaltis, Robert J., 4,346,009, Cl. 210-512.100.
Shanks, Ian A., to National Research Development Corporation. Double trace electro optic display. 4,346,378, Cl. 340-754.000.
Shannon, Michael A.: *See*—
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Sharp, James M.: *See*—
Gilmour, Neil J. L.; Martin, William B.; Sharp, James M.; Thompson, Dennis A.; and Wells, Peter W., 4,346,074, Cl. 424-92.000.
Sharp, Russell G.: *See*—
Wilkinson, William R.; Sharp, Russell G.; Reed, Charles C.; Cooley, Denton A.; and Crane, Terry N., 4,345,919, Cl. 55-41.000.
Sharvit, Martin M., to Cindon Research Inc. Telephone call restriction apparatus. 4,346,264, Cl. 179-18.0DA.
Shashaty, Alex. Boring machine and method of rigidizing a boring bar. 4,345,860, Cl. 408-1.00R.
Shekel, Joseph; and DeStefano, Joseph, to Auto-Line Manufacturing Corp. Battery cable connector. 4,345,807, Cl. 339-31.00B.
Shell Oil Company: *See*—
Berni, Albert J., 4,345,473, Cl. 73-516.0LM.
Kramer, Petrus A., 4,346,038, Cl. 549-302.000.
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Shephard, Philip C., to I.H.W. Engineering Limited. Seat reclining mechanism. 4,345,792, Cl. 297-362.000.
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Shields, Neal G., to Specific Cruise Systems, Inc. Speed governor with dual safety system. 4,345,663, Cl. 180-177.000.
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Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, 4,345,834, Cl. 355-3.00R.
Shih-Li, Chao. Webbed glove for swimming use. 4,345,335, Cl. 2-161.00A.
Shillito, Richard: *See*—
Pamplin, John W.; Astbury, Brian R.; and Shillito, Richard, 4,345,451, Cl. 72-286.000.
Shimano Industrial Company Limited: *See*—
Noda, Hideo, 4,345,726, Cl. 242-212.000.
Shimazaki, Takeshi: *See*—
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Shimizu Construction Co. Ltd.: *See*—
Suzuki, Yoshinobu; Chiba, Kiyoshi; Tukuhiro, Tomoya; Iwasawa, Yoshiyuki; Kajioka, Yasuo; and Komine, Tomio, 4,345,431, Cl. 60-286.000.
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Shinbori, Kenichi; Sakai, Shinji; Shinoda, Nobuhiko; Ito, Tadashi; and Murakami, Hiroyasu, to Canon Kabushiki Kaisha. Program-controlled camera. 4,345,829, Cl. 354-37.000.
Shinjo, Katsumi, to Yugen Kaisha Shinjoseisakusho. Chute-hose coupler unit for an automatic assembling machine. 4,345,677, Cl. 193-2.00A.
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Sekigawa, Kenji; Sato, Takeshi; and Motizuki, Mikio, 4,345,372, Cl. 29-874.000.
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Shinohara, Hiroichi, to Kabushiki Kaisha Ricoh. Reproduction lens having a six group six element composition a large vignetting factor and a compact size. 4,345,823, Cl. 350-464.000.
Shiono, Shigeo: *See*—
Endo, Fumihiro; Ishikawa, Toshio; Ozawa, Jun; Kamata, Yuzuru; and Shiono, Shigeo, 4,345,471, Cl. 374-188.000.
Shionogi & Co., Ltd.: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,346,218, Cl. 544-16.000.
Shipman, Matthew W. Apparatus for the cleaning and sanitation of a restroom or lavoratory. 4,345,343, Cl. 4-662.000.
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Tomita, Fusao; Tamaoki, Tatsuya; Nakamura, Nobuo; Okubo, Shuji; Shirahata, Kunikatsu; Kasai, Masaji; and Oka, Tetsuo, 4,346,075, Cl. 424-120.000.
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Shtrikman, Shmuel, to Yeda Research and Development Co. Ltd. Linear motion devices. 4,346,318, Cl. 310-12.000.

Shultz, William E. Method and apparatus for injecting viscous materials. 4,345,667, Cl. 184-1.00D.

Sichling, Georg H., to Siemens Corporation. Fiber optical sensor system, preferably for measuring physical parameters. 4,346,478, Cl. 455-612.000.

Sidwell, Albert E.: *See—*
Deavenport, Dennis L.; Howard, Kenneth J.; and Sidwell, Albert E., 4,346,248, Cl. 568-776.000.

Siegmund, Walter P., to American Optical Corporation. Lens array. 4,345,833, Cl. 355-1.000.

Siemens Aktiengesellschaft: *See—*
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Kunze, Dieter, 4,346,258, Cl. 174-93.000.
Montag, Bernhard; and Optiz, Heinrich, 4,346,166, Cl. 430-435.000.
Pirner, Paul; and Muehling, Alois, 4,346,359, Cl. 335-202.000.

Siemens Corporation: *See—*
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Sievert, Bruce G.: *See—*
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Sigdell, Jan-Erik; and Krick, Gerd, to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie K.G., Apparatebau K.G. Apparatus for preventing the entry of air into an artificial organ. 4,345,999, Cl. 210-188.000.

Signetics Corporation: *See—*
Blauschild, Robert A., 4,346,344, Cl. 323-313.000.

Silberberg, Jeffrey L., to United States of America, Health, Education and Welfare. Instrument for measuring true-RMS A.C. voltage and A.C. voltage fluctuations. 4,346,346, Cl. 324-132.000.

Simer Pump Company: *See—*
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Simms, John A., to Du Pont de Nemours, E. I., and Company. Polymer blend of an acrylic polymer and a block polymer of acrylic segments and polymercaptan segment. 4,346,201, Cl. 525-440.000.

Simpson, Elmer J.; and Rued, Glen A., to Elevator Equipment Co. Elevator fluid flow control valve. 4,345,507, Cl. 91-449.000.

Simpson, Ronald P.: *See—*
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Sinclair, Lawrence L. Cooking and cutting implement. 4,345,516, Cl. 99-426.000.

Singer, Adam, to Upjohn Manufacturing Company M, The. Method for preventing adhesion formation. 4,346,108, Cl. 424-317.000.

Singer Company, The: *See—*
Gwynn, Eric C. E., 4,345,817, Cl. 350-174.000.

Singh, Baldev: *See—*
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Singh, Gurnam, to Bourns Instruments, Inc. Differential pressure transducer with high compliance, constant stress cantilever beam. 4,345,476, Cl. 73-720.000.

Single, Arthur W., II: *See—*
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Sircar, Shivaji: *See—*
Dalton, Augustine I., Jr.; and Sircar, Shivaji, 4,346,019, Cl. 252-416.000.

SITEG Siebtechnik GmbH: *See—*
Lefferts, Johannes, 4,346,138, Cl. 428-222.000.

Sivilotti, Olivo G.; Sulzer, John; and Treganza, Alan F., to Alcan Research and Development Limited. Means and method for containing flowing or standing molten metal. 4,345,743, Cl. 266-44.000.

Sizemore, Ronald D.; Tucci, John J.; and Willette, Albert D., to AMP Incorporated. Molding plastic bodies on continuous strip. 4,345,889, Cl. 425-122.000.

SJ Marketing Incorporated: *See—*
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Sjostedt, Carl-Goran: *See—*
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Skaggs, William G.; and Curry, John L., to NCR Corporation. AC Drive system for plasma display panels. 4,346,379, Cl. 340-778.000.

Skoda, oborovy podnik: *See—*
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Skowronski, Michael J.: *See—*
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Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Schillinger, Eckehard, to Schering Aktiengesellschaft. Novel 11-oxoprostaglandin derivatives. 4,346,228, Cl. 560-53.000.

Slater, Richard A.: *See—*
Plank, Odas P.; Slater, Richard A.; and Taibbi, Steven G., 4,346,441, Cl. 364-200.000.

Slater Steel Industries Limited: *See—*
Nigol, Olaf, 4,346,255, Cl. 174-42.000.

Slavin, Roy H.; and Scharbert, W. Donald, to Standard Grigsby, Inc. Rotary switch and method of mounting contacts. 4,346,269, Cl. 200-11.0DA.

Sleeth, Robert S.: *See—*
Monticelli, Dennis M.; Howard, William M.; and Sleeth, Robert S., 4,346,380, Cl. 340-825.630.

Smathers, Robert E.: *See—*
Hanson, Steven P.; Smathers, Robert E.; and Morrison, Howard J., 4,345,402, Cl. 46-206.000.

Smith, Gerald B.: *See—*
Rothwell, Thomas F.; and Smith, Gerald B., 4,345,961, Cl. 156-294.000.

Smith, Leslie H., to Imperial Chemical Industries Limited. Alkanolamine derivatives. 4,346,111, Cl. 424-324.000.

Smith, Roger, Jr.; and Langowski, Faustyn C., to BJ-Hughes Inc. Pipe manipulator. 4,345,864, Cl. 414-22.000.

Smith, Willard P.; and Hutchinson, Bruce R., to Stone-Platt Fluidfire Limited. Light fuel start-up fluidized bed combustor. 4,345,894, Cl. 431-170.000.

Smith, William N.: *See—*
Bauer, Werner R.; and Smith, William N., 4,345,369, Cl. 29-622.000.

Snelling, Christopher: *See—*
Kramer, Charles J.; Kay, David B.; and Snelling, Christopher, 4,345,835, Cl. 355-3.00R.

Snyder, Raymond W.: *See—*
Moss, Lee C.; Knox, Phillip J.; and Snyder, Raymond W., 4,346,257, Cl. 174-72.00B.

Snyder, Ronald R.: *See—*
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,345,504, Cl. 89-37.0GM.

Societe Anonyme dite: Carbonisation Entreprise et Ceramique: *See—*
Cochet, Gerard; and Provost, Gilbert, 4,346,177, Cl. 501-123.000.

Societe d'Applications Generales d'Electricite et de Mecanique SAGEM: *See—*
Deval, Alain, 4,345,474, Cl. 73-517.00B.

Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,346,100, Cl. 424-275.000.

Societe Francaise Hoechst: *See—*
Schouteeten, Alain; and Christidis, Yani, 4,346,238, Cl. 568-432.000.

Societe Mecanique Generale et Decolletage Tournage: *See—*
Rolland, Guy, 4,345,684, Cl. 198-781.000.

Societe Metallurgique de Gerzat: *See—*
Coupry, Jean; and Anagnostidis, Marc, 4,345,951, Cl. 148-2.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Livet, Jean-Luc; and Bretaudeau, Maurice, 4,345,485, Cl. 74-5.100.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Tu Xuan, Mai; Jufer, Marcel; and Pittet, Andre, 4,346,463, Cl. 368-157.000.

Soderberg, John H.; and Penque, Leonard M., to Pitney Bowes Inc. Inhibiting means for postage register parcel identification system. 4,345,521, Cl. 101-93.000.

Sokolenko, Anatoly I.: *See—*
Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.

Solmat Systems Ltd.: *See—*
Shacher, Sraya, 4,345,581, Cl. 126-415.000.

Solomon, Martin D. Closure assembly with protective lock. 4,345,448, Cl. 70-95.000.

Solomon, Martin D. Rolling protective gate for store fronts or the like. 4,345,635, Cl. 160-133.000.

Soluyanov, Vadim G.: *See—*
Lezgintsev, Georgy M.; Garbuz, Evgeny I.; Kontar, Evgeny A.; Glukhikh, Rudolf G.; Murdmaa, Ivar O.; Soluyanov, Vadim G.; Belyavsky, Alexandr S.; and Kuznetsov, Alexei N., 4,345,461, Cl. 73-170.00A.

Somekh, George S.; and Cupper, Robert A., to Union Carbide Corporation. Method of improving antiwear properties of high temperature hydrocarbon compositions. 4,346,015, Cl. 252-50.000.

Sommerfeld, George L., to Tennant Company. Filtering device. 4,345,353, Cl. 15-349.000.

Sonoda, Noboru; Murai, Shinji; and Takii, Kazuhisa, to Okamura Oil Mill Limited; and Daikin Kogyo Co., Ltd. Fluorine-containing compounds. 4,346,235, Cl. 562-596.000.

Sony Corporation: *See—*
Akutagawa, Touru; Okada, Takashi; and Tanaka, Yutaka, 4,346,399, Cl. 358-29.000.
Ohsawa, Mitsuo; Noda, Yoshiteru; Ichikawa, Iwao; and Yamamoto, Katsumi, 4,345,371, Cl. 29-836.000.

Sorensen, Egon, to AMF, Inc. Dispenser. 4,345,802, Cl. 312-42.000.

Sottini, Stefano: *See—*
Righini, Giancarlo; Sottini, Stefano; and Russo, Vera, 4,345,815, Cl. 350-96.180.

Soukup, Frantisek: *See—*
Zobac, Ladislav; Malek, Zdenek; Soukup, Frantisek; Ryska, Antonin; Jelinek, Jan; and Busta, Jiri, 4,345,598, Cl. 128-303.100.

Soula, Gerard; and Linguenheld, Louis, to Rhone-Poulenc Industries. Preparation of chloroalkoxybenzenes. 4,346,244, Cl. 568-656.000.

Sourirajan, Srinivasa: *See—*
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinivasa, 4,346,126, Cl. 427-209.000.

Soussloff, Dimitri G., to Harrington Hoists. Mounting device. 4,345,851, Cl. 403-369.000.

Souther, Louis C. Linear tracking tone arm. 4,346,467, Cl. 369-249.000.

Southern California Edison Company: *See—*
Welz, Ronald C., 4,346,345, Cl. 324-110.000.

Souza, David W., to SJ Marketing Incorporated. Variable quantity dispensing device for granular material. 4,345,700, Cl. 222-438.000.

Sparzak, Walter J., Sr.: *See—*
Choi, Jae H.; Mottine, John J., Jr.; Sparzak, Walter J., Sr.; and Vesperman, William C., 4,346,145, Cl. 428-389.000.

Spatz, David M., to American Cyanamid Company. Method for preparing substituted meta-phenylalkoxynitrobenzenes. 4,346,242, Cl. 568-586.000.

Specific Cruise Systems, Inc.: *See—*
Shields, Neal G., 4,345,663, Cl. 180-177.000.

Spector, Donald. Aroma-generating lamp structure. 4,346,059, Cl. 422-125.000.

Speer, Richard A., to Apollo Systems, Inc. Ball projecting device capable of providing spin. 4,345,578, Cl. 124-56.000.

Speicher, Gerald W. Fireplace damper attachment. 4,345,580, Cl. 126-288.000.

Spengler, Emerson D.; and Schaeffer, Charles W., to Bethlehem Steel Corporation. Method of making metal forming punches. 4,345,492, Cl. 76-101.00R.

Sperry Corporation: *See—*
Breeden, Robert H., 4,345,435, Cl. 60-420.000.
Lewandowski, Walter S., 4,346,339, Cl. 323-245.000.

Spex Industries Inc.: *See—*
Mitteldorf, Arthur J.; Marcovecchio, Joseph; and Boquiron, Rodolfo A., 4,346,299, Cl. 378-204.000.

Spin Physics, Inc.: *See—*
Cullum, Dennis F.; and Dorreboom, Jelmer, 4,346,418, Cl. 360-129.000.
Griffith, Neil J., 4,346,417, Cl. 360-115.000.

Spiral Systems Inc.: *See—*
Campbell, Jeptha E.; and Gilchrist, James E., 4,345,628, Cl. 141-83.000.

Spivey, Bron W.: *See—*
Davis, Michael A.; and Spivey, Bron W., 4,345,424, Cl. 57-209.000.

Sprecker, Mark A.; and Hall, John B., to International Flavors & Fragrances Inc. Substituted tricyclodecane derivatives. 4,346,245, Cl. 568-665.000.

Sprecker, Mark A.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,346,080, Cl. 424-84.000.

Springs, Daniel R.: *See—*
Goss, David C.; and Springs, Daniel R., 4,345,368, Cl. 29-611.000.

SRI International: *See—*
Levins, Donald A.; Bedford, Clifford D.; and Coon, Clifford L., 4,346,222, Cl. 544-322.000.

Stal-Laval Apparat AB: *See—*
Lofgren, Lars; and Ostlund, Artur, 4,346,054, Cl. 422-49.000.

Standard Grigsby, Inc.: *See—*
Slavin, Roy H.; and Scharbert, W. Donald, 4,346,269, Cl. 200-11.0DA.

Standard Oil Company (Indiana): *See—*
Knox, Jack R., 4,346,052, Cl. 264-176.00F.

Stanley Aviation Corp.: *See—*
Gale, Edwin J., 4,346,428, Cl. 361-215.000.

Stanton, C. Robert. Recirculating system for gas-fired furnace. 4,345,897, Cl. 432-72.000.

Stanwick, Tad. Trapped air method of generating rotary power in a deepsea environment. 4,345,433, Cl. 60-327.000.

Stanwood, David A.: *See—*
Finley, Richard O.; and Stanwood, David A., 4,345,805, Cl. 339-16.00R.

Staten, Gilbert S.: *See—*
Tao, Eddie V. P.; and Staten, Gilbert S., 4,346,225, Cl. 548-138.000.

Steele, Richard J. Pipe cutter for end cuts of tubular material. 4,345,745, Cl. 266-56.000.

Steele, Robert L.: *See—*
Braund, Darwin G.; Fronk, Thomas J.; Goings, Richard L.; Peters, John W.; and Steele, Robert L., 4,346,077, Cl. 424-156.000.

Stegelman, Albert F., to Phillips Petroleum Company. Catalytic cracking process. 4,345,991, Cl. 208-78.000.

Steigerwald, Robert L., to General Electric Company. Field controlled thyristor switching power supply. 4,346,431, Cl. 363-27.000.

Steiner, Charles W., to Simer Pump Company. Hydraulic switch for a pump. 4,345,879, Cl. 417-40.000.

Steiner Corporation: *See—*
Cassia, Antonio M., 4,345,627, Cl. 141-18.000.

Stemme, Otto; Lermann, Peter; and Cocron, Istvan, to AGFA-Gevaert Aktiengesellschaft. Distance-measuring system with in-range signalling for use with cameras, alarms, and the like. 4,345,827, Cl. 354-25.000.

Stenemann, Bruno, to Octanorm-Vertriebs GmbH fur Bauelemente. Framework of releasably-connectable bars. 4,345,849, Cl. 403-252.000.

Stephan, Michael: *See—*
Schwarz, Alois; Mautz, Karl-Heinz; and Stephan, Michael, 4,345,876, Cl. 416-134.00A.

Stepien, John A.: *See—*
Brown, Robert B.; and Stepien, John A., 4,345,727, Cl. 244-102.00R.

Stepnov, Ksenofont K.: *See—*
Gulakov, Sergei V.; Nosovsky, Boris I.; Leschinsky, Leonid K.; Stepnov, Ksenofont K.; and Rudnev, Anatoly E., 4,346,280, Cl. 219-76.100.

Sterett, Robert A., to LOF Plastics Inc. Louver assembly. 4,345,510, Cl. 98-40.0VM.

Sterling Drug Inc.: *See—*
Lesher, George Y.; Dickinson, William B.; and Singh, Baldev, 4,346,221, Cl. 544-238.000.

Stewart, David G.: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,346,021, Cl. 252-431.00N.

Stewart, Dorothy M., executrix: *See—*
Tosato, Larry P.; Wehrli, Henry A.; and Stewart, Robert C., deceased, 4,345,671, Cl. 187-95.000.

Stewart, Robert C., deceased: *See—*
Tosato, Larry P.; Wehrli, Henry A.; and Stewart, Robert C., deceased, 4,345,671, Cl. 187-95.000.

Stewart, William S., to Phillips Petroleum Company. Control of a fluid catalytic cracking unit. 4,345,993, Cl. 208-164.000.

Stitt, Robert M.: *See—*
Albaugh, Neil P.; and Stitt, Robert M., 4,346,294, Cl. 250-227.000.

Stolka, Milan: *See—*
Pai, Damodar M.; Stolka, Milan; and Yanus, John F., 4,346,158, Cl. 430-59.000.

Stoll, Donald H., to General Electric Company. Control device and method of operating. 4,346,272, Cl. 200-83.00C.

Stone-Platt Fluidfire Limited: *See—*
Smith, Willard P.; and Hutchinson, Bruce R., 4,345,894, Cl. 431-170.000.

Stone, William M.: *See—*
Drapeau, Raoul E.; and Stone, William M., 4,346,453, Cl. 364-900.000.

Stork Amsterdam B.V.: *See—*
van Drooge, Barend L., 4,346,000, Cl. 210-195.100.

Stout, Donald L.: *See—*
Randolph, Jeptha F.; and Stout, Donald L., 4,345,801, Cl. 308-238.000.

Stout, Garry A.; and Ray, Donald L., to Emhart Industries, Inc. Timing mechanism with a digital clock. 4,346,270, Cl. 200-33.00R.

Straker, Michael. Protective pad for mounting on a bicycle pedal. 4,345,487, Cl. 74-563.000.

Streit, Kenneth F., to Techplastics, Inc. Shelving display and support. 4,345,526, Cl. 108-111.000.

Stretch Devices, Inc.: *See—*
Newman, Don E., 4,345,390, Cl. 38-102.910.

Studinger, John. Adjustable base mount for a walking-beam gas compressor. 4,345,734, Cl. 248-669.000.

Sud, Rahul; Hardee, Kim C.; and Heightley, John O., to INMOS Corporation. Redundancy scheme for an MOS memory. 4,346,459, Cl. 365-200.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Hauser, Kurt, 4,345,641, Cl. 165-41.000.

Sudilovsky, Abraham, to E. R. Squibb & Sons, Inc. Method for inhibiting onset of migraine headaches with nadolol compositions. 4,346,106, Cl. 424-311.000.

Sugasawa, Fukashi: *See—*
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,345,571, Cl. 123-568.000.

Sugden, Mary L. Circuit board ejector and guide. 4,345,809, Cl. 339-45.00M.

Sugier, Andre; Freund, Edouard; and Le Page, Jean-Francois, to Institut Francais du Petrole. Production of alcohols from synthesis gases. 4,346,179, Cl. 518-707.000.

Sugishita, Kaneo: *See—*
Tsunoda, Sachio; and Sugishita, Kaneo, 4,346,304, Cl. 290-52.000.

Sulim, Georgy T.: *See—*
Polyakov, Nikolai F.; Ryabchenjuk, Leonid M.; Emelyanova, Nina A.; Sulim, Georgy T.; Kobzar, Vladimir A.; Peresunko, Stanislav R.; Sokolenko, Anatoly I.; and Ivanenko, Oleg V., 4,346,003, Cl. 210-225.000.

Sullivan, David T. Pocket sheet insert sheet assemblage and method of using the assemblage. 4,345,394, Cl. 40-405.000.

Sullivan, James E., to Gulfko Incorporated. Water based aluminum paint. 4,346,149, Cl. 428-516.000.

Sullivan, John L., to A-T-O Inc. Pressure-demand breathing apparatus with automatic air shut-off. 4,345,593, Cl. 128-204.260.

Sullivan, John L.: *See—*
Giorgini, Eugene A.; and Sullivan, John L., 4,345,592, Cl. 128-204.260.

Sulzer Brothers Limited: *See—*
Muller, Arnold; and Brockel, Gerhard, 4,345,339, Cl. 3-1.000.

Sulzer, John: *See—*
Sivilotti, Olivo G.; Sulzer, John; and Treganza, Alan F., 4,345,743, Cl. 266-44.000.

Sulzer Morat GmbH: *See—*
Schaberle, Erwin, 4,345,446, Cl. 66-9.00B.

Sumitomo Chemical Company, Limited: *See—*
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,346,046, Cl. 260-458.00C.
Sanjiki, Tetsutaro; Seta, Akinori; and Kiyohara, Takao, 4,346,096, Cl. 424-273.00R.

Sumitomo Electric Industries, Ltd.: *See—*
Osawa, Yoshitaka; Nishimura, Akira; and Toyooka, Shinichi, 4,346,139, Cl. 428-252.000.
Saito, Yasunori; Nakagaki, Kunihiro; Yoneyama, Kunihiko; and Ohmoto, Katsumi, 4,346,253, Cl. 174-29.000.

Sumrell, Gene: *See—*
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,346,043, Cl. 260-404.000.

Sun-Woods Engineering Ltd.: *See—*
Ellis, Victor C., 4,345,585, Cl. 126-429.000.

Sundins Fabriker AB: *See—*
Petersson, Ralf K. E., deceased; and Vejdemo, Stephan, executor, 4,345,881, Cl. 417-270.000.

Super Shops, Inc.: *See—*
Moseley, Gordon P.; and Christner, Kurt W., 4,345,576, Cl. 123-604.000.

Suslov, Alexandr N.: *See—*
Minasov, Alexandr N.; Suslov, Alexandr N.; Azimov, Alexandr A.; and Marapulets, Gennady N., 4,345,867, Cl. 414-287.000.

Suto, Shoichi: *See*—
Kawachi, Masao; Tomaru, Satoru; Edahiro, Takao; and Suto, Shoichi, 4,345,928, Cl. 65-18.200.

Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Webbing slider lock mechanism. 4,345,781, Cl. 280-802.000.

Suzuki, Masakazu; Furuichi, Shuhei; and Ikeda, Toshiaki, to Kabushiki Kaisha Morita Seisakusho. X-ray photographic apparatus. 4,346,297, Cl. 378-110.000.

Suzuki, Masaki: *See*—
Hara, Yoshihumi; Kubota, Saburo; Ihara, Akira; Kishimoto, Masaru; and Suzuki, Masaki, 4,345,472, Cl. 73-462.000.

Suzuki, Nagatoshi; Araki, Sadaakira; and Kawazoe, Soichi. Engine exhaust gas reflux apparatus. 4,345,572, Cl. 123-568.000.

Suzuki, Shigeo: *See*—
Kakuta, Atsushi; Suzuki, Shigeo; Mori, Yasuki; and Morishita, Hirosada, 4,346,157, Cl. 430-58.000.

Suzuki, Takeshi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.

Suzuki, Yoshiaki: *See*—
Sawada, Satoru; Oono, Shigeru; Seto, Nobuo; Suzuki, Yoshiaki; Nakamura, Kotaro; and Furutachi, Nobuo, 4,346,165, Cl. 430-372.000.

Suzuki, Yoshikazu: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.

Suzuki, Yoshinobu; Chiba, Kiyoshi; Tukuhiro, Tomoya; Iwasawa, Yoshiyuki; Kajioka, Yasuo; and Komine, Tomio, to Shimizu Construction Co. Ltd. Exhaust gas cleaning system for diesel engines. 4,345,431, Cl. 60-286.000.

Svenska Traforskningsinstitutet: *See*—
Norman, Bo; and Grundstrom, Karl-Johan, 4,346,007, Cl. 210-360.100.

Swank, Bryan W.: *See*—
Kasting, Edward W.; Glasson, Richard E.; and Swank, Bryan W., 4,345,552, Cl. 123-90.380.

Swanson, Arthur P. Golf club. 4,345,763, Cl. 273-164.000.

Swartz, Mitchell R., to Massachusetts Institute of Technology. Electrochemical process and apparatus to control the chemical state of a material. 4,346,172, Cl. 435-168.000.

Swerlick, Isadore: *See*—
Garlington, William D.; and Swerlick, Isadore, 4,346,215, Cl. 528-348.000.

Sze, Daniel T. W., to International Business Machines Corporation. Even-odd parity checking for synchronous data transmission. 4,346,474, Cl. 371-49.000.

Szell nee Hasenohrl, Erzsebet: *See*—
Bajusz, Sandor; Szell nee Hasenohrl, Erzsebet; Barabas, Eva; Bagdy, Daniel; and Mohai nee Nagy, Zsuzsanna, 4,346,078, Cl. 424-177.000.

T. T. Haaksbergen B.V.: *See*—
Leuvelink, Gerrit W. E., 4,345,730, Cl. 245-6.000.

Tabarelli, Werner; and Lobach, Ernst W. Photolithographic method for the manufacture of integrated circuits. 4,346,164, Cl. 430-311.000.

Tabor, Edward: *See*—
Aronson, David L.; Tabor, Edward; and Gerety, Robert J., 4,346,073, Cl. 424-86.000.

Tachihara, Satoru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens. 4,345,821, Cl. 350-427.000.

Tachihara, Satoru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Telephoto zoom lens. 4,345,822, Cl. 350-427.000.

Tada, Hiroji: *See*—
Sato, Takeshi; Tada, Hiroji; and Yano, Yoshiichi, 4,345,686, Cl. 206-219.000.

Tada, Hisashi: *See*—
Asai, Hajime; Tada, Hisashi; and Gomi, Takeo, 4,345,959, Cl. 156-244.110.

Taga, Yutaka: *See*—
Numazawa, Akio; Taga, Yutaka; and Funato, Masayoshi, 4,345,904, Cl. 474-215.000.

Tagaya, Osamu: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; and Koyanagi, Nozomu, 4,346,109, Cl. 424-318.000.

Taibbi, Steven G.: *See*—
Plank, Odas P.; Slater, Richard A.; and Taibbi, Steven G., 4,346,441, Cl. 364-200.000.

Tajima, Masahiko: *See*—
Kondo, Toshio; Sagisaka, Yasuo; Tajima, Masahiko; and Kobayashi, Akio, 4,345,561, Cl. 123-440.000.

Takacs, Istvan; Vereczkey, Endre; Bosits, Gyula; and Kerey, Gyorgy, to Richter Gedeon Vegyeszeti Gyar Rt. Apparatus for the treatment of solid, granular and/or lumpy materials. 4,345,720, Cl. 241-74.000.

Takada, Masaki: *See*—
Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, 4,346,173, Cl. 435-189.000.

Takagi, Kazumasa; and Tsunoda, Masakazu, to Nissan Motor Company, Limited. Voice warning system for an automotive vehicle with ready-to-drive sensor. 4,346,364, Cl. 340-52.00D.

Takahama, Akio, to Nippon Kogaku K.K. Divisional reading device for sine signals. 4,346,447, Cl. 364-560.000.

Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, to Hitachi Chemical Company, Ltd. Imide prepolymer from reaction of epoxy compound with bis-imide/diamine reaction mixture. 4,346,206, Cl. 528-88.000.

Takahashi, Akira; and Hashimoto, Masanori, to Ricoh Company, Ltd. Shutter speed setting and display apparatus. 4,345,826, Cl. 354-23.00D.

Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, to Nippon Piston Ring Co., Ltd. Abrasion resistant sintered alloy for internal combustion engines. 4,345,942, Cl. 75-237.000.

Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, to Nippon Piston Ring Co., Ltd. Abrasion resistant sintered alloy for internal combustion engines. 4,345,943, Cl. 75-238.000.

Takahashi, Sadao: *See*—
Sato, Kouji; Takahashi, Sadao; and Kodama, Toshikazu, 4,346,322, Cl. 310-313.00B.

Takao, Hiroshi: *See*—
Tohda, Masayuki; Takao, Hiroshi; and Kimura, Shinji, 4,345,985, Cl. 204-192.0EC.

Takeshita, Masajiro: *See*—
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,345,942, Cl. 75-237.000.
Takahashi, Kentaro; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,345,943, Cl. 75-238.000.

Takeuchi, Yasuhisa: *See*—
Miyamoto, Keiichi; Inoue, Naohiko; and Takeuchi, Yasuhisa, 4,345,522, Cl. 104-89.000.

Takeyama, Kenichi; Morimoto, Takayoshi; and Hibino, Kunio, to Matsushita Electric Industrial Co. Ltd. Resist for use in forming a positive pattern with a radiation and process for forming a positive pattern with radiation. 4,346,163, Cl. 430-280.000.

Takigawa, Hiroyoshi; and Miyamura, Nobuhiro, to Bridgestone Tire Co., Ltd. Tread with spaced projections in stone ejecting groove. 4,345,632, Cl. 152-209.00R.

Takiguchi, Yo; Mishima, Hiroshi; Yamamoto, Shinjiro; and Terao, Michiya, to Sankyo Company, Limited. Fermentation process for producing compound having anthelmintic and acaricidal activities. 4,346,171, Cl. 435-119.000.

Takii, Kazuhisa: *See*—
Sonoda, Noboru; Murai, Shinji; and Takii, Kazuhisa, 4,346,235, Cl. 562-596.000.

Talbot, William J., Jr.: *See*—
Uyeda, Stanley T.; Radu, E. John; Talbot, William J., Jr.; and Feldman, Norman, 4,345,855, Cl. 405-168.000.

Tamaoki, Tatsuya: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Nakamura, Nobuo; Okubo, Shuji; Shirahata, Kunikatsu; Kasai, Masaji; and Oka, Tetsuo, 4,346,075, Cl. 424-120.000.

Tamasovics, John F.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,345,693, Cl. 220-3.300.

Tamura, Shigeru, to Kabushiki Kaisha n a c. Process and device for producing animated cartoons. 4,346,403, Cl. 358-93.000.

Tanaka, Kazuyoshi; Kato, Hisatoyo; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Radiation image read out device. 4,346,295, Cl. 250-327.200.

Tanaka, Minoru: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,346,227, Cl. 560-119.000.

Tanaka, Toru: *See*—
Komatsu, Makoto; Tanaka, Toru; and Fujita, Hideaki, 4,346,232, Cl. 562-416.000.

Tanaka, Yutaka: *See*—
Akutagawa, Touru; Okada, Takashi; and Tanaka, Yutaka, 4,346,399, Cl. 358-29.000.

Tanida, Hiroshi: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata Wataru, 4,346,218, Cl. 544-16.000.

Tanino, Yukio: *See*—
Kazama, Yoshiteru; Kokubo, Isao; Tsuji, Akitoshi; and Tanino, Yukio, 4,345,944, Cl. 106-90.000.

Tanouchi, Tadao; Kawamura, Masanori; Okada, Takanori; and Hayashi, Masaki, to Ono Pharmaceutical Co., Ltd.; and Kissei Pharmaceutical Co., Ltd. Carboxy-imidazole derivatives, compositions and use. 4,346,099, Cl. 424-273.00R.

Tanson, Rodolphe F.: *See*—
Rinio, Johannes A.; and Tanson, Rodolphe F., 4,345,741, Cl. 254-287.000.

Tao, Eddie V. P.; and Staten, Gilbert S., to Eli Lilly and Company. Herbicidal 2-methylamino thiadiazolines. 4,346,225, Cl. 548-138.000.

Tate & Lyle Limited: *See*—
Rundell, John T.; Pottage, Paul R.; and Harradine, Ronald J., 4,345,947, Cl. 127-48.000.

TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Leinweber, Walter, 4,346,367, Cl. 340-347.0DD.

Technicare Corporation: *See*—
Schiff, Charles M.; Maxon, Eric K.; and West, Ronald E., 4,345,847, Cl. 403-103.000.

Technicon Instruments Corporation: *See*—
Hirschfeld, Tomas, 4,346,323, Cl. 313-111.000.

Techniques Industrielles et Minieres: *See*—
Valantin, Alfred, 4,345,854, Cl. 405-159.000.

Technische Hogeschool Eindhoven: *See*—
Willems, Leonardus F.; and Vogten, Leonardus L. M., 4,346,262, Cl. 179-1.0SA.

Technomatic AG: *See—*
Ruchser, Erich; Ott, Helmut; and Baldauf, Gunter, 4,345,620, Cl. 137-596.160.

Techplastics, Inc.: *See—*
Streit, Kenneth F., 4,345,526, Cl. 108-111.000.

Tektronix, Inc.: *See—*
Baetke, Robert E., 4,346,352, Cl. 331-178.000.
Dagostino, Thomas P., 4,346,333, Cl. 315-367.000.

Temperly, Thomas: *See—*
Schroeder, Donald E.; and Temperly, Thomas, 4,345,409, Cl. 52-693.000.

Tennant Company: *See—*
Sommerfeld, George L., 4,345,353, Cl. 15-349.000.

Terabayashi, Gosaku, to Toyota Jidosha Kogyo Kabushiki Kaisha. Window wiper for vehicle. 4,345,352, Cl. 15-250.160.

Terahara, Akira; and Tanaka, Minoru, to Sankyo Company, Limited. ML-236B Derivatives and their preparation. 4,346,227, Cl. 560-119.000.

Terao, Michiya: *See—*
Takiguchi, Yo; Mishima, Hiroshi; Yamamoto, Shinjiro; and Terao, Michiya, 4,346,171, Cl. 435-119.000.

Terrell, Jamie B., to Gearhart Industries, Inc. Apparatus for chemical cutting. 4,345,646, Cl. 166-55.000.

Terrell, Ross C.; and Hansen, Kirsten, to Airco, Inc. Process for adjusting the halogen content of halogenated aliphatic ethers. 4,346,246, Cl. 568-684.000.

Terry, Paul V. Retractor for hose-connected hand pieces. 4,345,616, Cl. 137-355.170.

Tessarolo, Francesco: *See—*
Costanzi, Silvestro; Tessarolo, Francesco; Ballabio, Adriano; and Brunelli, Maurizio, 4,346,188, Cl. 524-104.000.

Tetra Pak International AB: *See—*
Jarund, Erik, 4,345,415, Cl. 53-450.000.

Texas Instruments Incorporated: *See—*
Allen, Charles A.; and Houston, David T., 4,346,390, Cl. 346-76.0PH.
Buss, Kenneth G.; and Culp, Norman L., 4,346,265, Cl. 179-84.00T.
McElroy, David J., 4,345,364, Cl. 29-571.000.

Texas Medical Products, Inc.: *See—*
Wilkinson, William R.; Sharp, Russell G.; Reed, Charles C.; Cooley, Denton A.; and Crane, Terry N., 4,345,919, Cl. 55-41.000.

Tezuka, Yasuo: *See—*
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,346,046, Cl. 260-458.00C.

Thayer, William L.: *See—*
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinivasa, 4,346,126, Cl. 427-209.000.

Thermacore, Inc.: *See—*
Ernst, Donald M.; and Copenhaver, Richard L., 4,345,642, Cl. 165-86.000.

Thermo Electron Corporation: *See—*
Lee, Chunghsin; and Oettinger, Peter E., 4,346,330, Cl. 315-150.000.

Thermon Manufacturing Co.: *See—*
Goss, David C.; and Springs, Daniel R., 4,345,368, Cl. 29-611.000.

Thibault, Thomas D., to Eli Lilly and Company. 2,4-Imidazolidinediones, compositions and herbicidal method. 4,345,935, Cl. 71-92.000.

Thibault, Thomas D.; and St. Clair, Roger L., to Eli Lilly and Company. Imidazoles, compositions and herbicidal method. 4,345,936, Cl. 71-92.000.

Thiokol Corporation: *See—*
Whitesides, Roger H., Jr., 4,345,427, Cl. 60-234.000.

Thomas Jefferson University: *See—*
Johnson, E. Marshall, 4,346,070, Cl. 424-9.000.

Thomas, Jeffrey G.: *See—*
Borin, Frank W.; and Thomas, Jeffrey G., 4,346,254, Cl. 174-37.000.

Thompson, Dennis A.: *See—*
Gilmour, Neil J. L.; Martin, William B.; Sharp, James M.; Thompson, Dennis A.; and Wells, Peter W., 4,346,074, Cl. 424-92.000.

Thompson, John S.; and Jadlocki, Joseph F., Jr., to FMC Corporation. Method for inhibiting the growth of *Clostridium botulinum* and the formation of enterotoxin in corned beef and poultry and products thereof. 4,346,117, Cl. 426-264.000.

Thompson, Malcolm J.; Mandava, Nagabhushanam; Worley, Joseph F., deceased (by Worley, Anita S., a personal representative); Meudt, Werner J.; Dutky, Samson R.; Robbins, William E.; and Flippen-Anderson, Judith L., to United States of America, Agriculture. Plant growth promoting brassinosteroids. 4,346,226, Cl. 549-268.000.

Thomson-CSF: *See—*
Driard, Bertrand; Ricodeau, Jean; and Rougeot, Henri, 4,346,326, Cl. 313-388.000.
Micheron, Francois, 4,345,359, Cl. 29-25.350.

Ti Creda Manufacturing Limited: *See—*
Lane, Richard J., 4,345,639, Cl. 165-10.000.

Tohda, Masayuki; Takao, Hiroshi; and Kimura, Shinji, to Nissan Motor Company, Limited. Method of producing solid electrolyte oxygen-sensing element of laminated structure. 4,345,985, Cl. 204-192.0EC.

Toho Chemical Industry Co., Ltd.: *See—*
Hamanaka, Hiroyoshi; and Shinano, Mamoru, 4,346,087, Cl. 424-244.000.

Tokarzewski, Richard J.: *See—*
Kiwala, Jacob; Tokarzewski, Richard J.; Schmitt, Frederick L.; and Sprecker, Mark A., 4,346,080, Cl. 424-84.000.

Tokas, Edward F.: *See—*
Peng, Fred M.; and Tokas, Edward F., 4,346,199, Cl. 525-316.000.

Tokieda, Takemi: *See—*
Nishimura, Nobuzi; Sawa, Utazi; Tokieda, Takemi; Hayakawa, Shun-ichi; and Tezuka, Yasuo, 4,346,046, Cl. 260-458.00C.

Tokyo Institute of Technology: *See—*
Ikawa, Tsuneo; and Yamase, Toshihiro, 4,345,982, Cl. 204-129.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kamata, Shohichi; Kimura, Yoshinori; and Hirai, Katsumi, 4,346,347, Cl. 324-158.00D.
Nakamura, Kunihiko; and Miyaji, Hiromi, 4,345,752, Cl. 271-12.000.
Nakaya, Shunichi; and Araoka, Katsumasa, 4,345,926, Cl. 62-38.000.
Ozeki, Kenichi; and Fushimi, Takashi, 4,345,874, Cl. 415-9.000.
Sato, Kouji; Takahashi, Sadao; and Kodama, Toshikazu, 4,346,322, Cl. 310-313.00B.
Tsunoda, Sachio; and Sugishita, Kaneo, 4,346,304, Cl. 290-52.000.

Tolliver, Wilbur E. Circumferential stirrup panel. 4,345,626, Cl. 140-107.000.

Tomabechi, Hideo; Osada, Hazime; and Osanai, Akira, to Olympus Optical Co., Ltd. Cassette tape recorder. 4,346,415, Cl. 360-105.000.

Tomaru, Satoru: *See—*
Kawachi, Masao; Tomaru, Satoru; Edahiro, Takao; and Suto, Shoichi, 4,345,928, Cl. 65-18.200.

Tomich, Robert G.: *See—*
Price, Charles E.; Ray, George C., III; Grieve, Harold R.; and Tomich, Robert G., 4,345,393, Cl. 40-312.000.

Tomiita, Kazuo: *See—*
Negishi, Takao; and Tomiita, Kazuo, 4,345,425, Cl. 57-289.000.

Tomita, Fusao; Tamaoki, Tatsuya; Nakamura, Nobuo; Okubo, Shuji; Shirahata, Kunikatsu; Kasai, Masaji; and Oka, Tetsuo, to Kyowa Hakko Kogyo Co., Ltd. Antibiotic DC-11 and process for production thereof. 4,346,075, Cl. 424-120.000.

Tonooka, Koji: *See—*
Abe, Hideshi; and Tonooka, Koji, 4,345,975, Cl. 203-37.000.

Toray Industries, Inc.: *See—*
Negishi, Takao; and Tomiita, Kazuo, 4,345,425, Cl. 57-289.000.

Toray Monofilament Company Limited: *See—*
Yoshimura, Hidenaga; Yamada, Kunio; Yamada, Hironori; Yamada, Ryusaku; and Kudo, Hiroaki, 4,345,602, Cl. 128-349.00R.

Torre, Jean-Paul: *See—*
Barlier, Pernette; and Torre, Jean-Paul, 4,346,147, Cl. 428-446.000.

Tosato, Larry P.; Wehrli, Henry A.; and Stewart, Robert C., deceased (by Stewart, Dorothy M., executrix), to Westinghouse Electric Corp. Apparatus and method for installing elevator guide rails. 4,345,671, Cl. 187-95.000.

Towmotor Corporation: *See—*
Callaghan, William I.; and Ehinger, Charles P., 4,345,673, Cl. 188-18.00R.

Toyo Jozo Kabushiki Kaisha: *See—*
Ikuta, Shigeru; Imamura, Shigeyuki; Ishikawa, Hidehiko; Matsuura, Kazuo; Takada, Masaki; and Misaki, Hideo, 4,346,173, Cl. 435-189.000.

Toyo Kogyo Co., Ltd.: *See—*
Iida, Koso; Shiraishi, Hideo; and Higashi, Haruki, 4,345,432, Cl. 60-290.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kasai, Kiyoshi; Kubota, Yoshitaka; and Tsukidate, Takaaki, 4,346,068, Cl. 423-344.000.

Toyooka, Shinichi: *See—*
Osawa, Yoshitaka; Nishimura, Akira; and Toyooka, Shinichi, 4,346,139, Cl. 428-252.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hasegawa, Junzo; Yamada, Masatoshi; Nakamura, Kaoru; and Yasuda, Eiichi, 4,345,771, Cl. 277-205.000.
Kawai, Hisasi; Sakurai, Kazuhiro; and Matsumoto, Muneaki, 4,345,737, Cl. 251-129.000.
Moriya, Shigeru; Ogawa, Hisashi; and Katsono, Mitsuaki, 4,345,780, Cl. 280-802.000.
Nakasu, Kei, 4,345,672, Cl. 188-1.110.
Numazawa, Akio; Taga, Yutaka; and Funato, Masayoshi, 4,345,904, Cl. 474-215.000.
Obata, Haruyuki, 4,345,573, Cl. 123-572.000.
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,345,781, Cl. 280-802.000.
Terabayashi, Gosaku, 4,345,352, Cl. 15-250.160.
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,345,782, Cl. 280-803.000.

TRE Corporation: *See—*
Mullich, Richard O., 4,345,449, Cl. 70-153.000.

Treganza, Alan F.: *See—*
Sivilotti, Olivo G.; Sulzer, John; and Treganza, Alan F., 4,345,743, Cl. 266-44.000.

Trendall, Paul B.: *See—*
Radvan, Bronislaw; Punton, Vaughan W.; and Trendall, Paul B., 4,345,970, Cl. 162-123.000.

Trent, Peter F.; and Charlebois, Raymond, to Plastibeton Canada Inc. Polymer concrete having low binder levels. 4,346,050, Cl. 264-71.000.

Tritsch, Ludwig, to Johnson & Johnson Baby Product Company. Diaper with resealable tape closure. 4,345,597, Cl. 128-287.000.

Tropea, Alfred, to Du Pont de Nemours, E. I., and Company. Application of durable, antistatic, soil release agent. 4,346,130, Cl. 427-393.100.

Trumpf GmbH & Co.: *See—*
Leibinger, Berthold; and Klingel, Hans, 4,345,744, Cl. 266-49.000.

Truth Incorporated: *See—*
Sandberg, Christopher T., 4,346,372, Cl. 340-545.000.
Tsao, George T.: *See—*
Ladisch, Michael R.; and Tsao, George T., 4,345,973, Cl. 203-19.000.
Tsien, Hsue C.: *See—*
Bellows, Richard J.; Grimes, Patrick G.; Newby, Kenneth R.; Einstein, Harry; and Tsien, Hsue C., 4,346,150, Cl. 429-18.000.
TSM. Traitements de Surface et Mecanique: *See—*
Blanc, Jacques; Coulon, Andre; and Pellus, Gilbert, 4,345,977, Cl. 204-26.000.
Tsuchida, Takayasu: *See—*
Akashi, Kunihiko; Nakamura, Yayoi; Tsuchida, Takayasu; Yoshii, Hiroe; and Ikeda, Shigeho, 4,346,169, Cl. 435-114.000.
Sano, Kounosuke; and Tsuchida, Takayasu, 4,346,170, Cl. 435-115.000.
Tsuji, Akitoshi: *See—*
Kazama, Yoshiteru; Kokubo, Isao; Tsuji, Akitoshi; and Tanino, Yukio, 4,345,944, Cl. 106-90.000.
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, to Shionogi & Co., Ltd. Cyclization process to form cephem ring. 4,346,218, Cl. 544-16.000.
Tsukamoto, Nobuo: *See—*
Ohkoshi, Seiei; Ishikawa, Isao; Okamoto, Teiji; and Tsukamoto, Nobuo, 4,346,472, Cl. 371-37.000.
Tsukanishi, Kenji: *See—*
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,346,206, Cl. 528-88.000.
Tsukidate, Takaaki: *See—*
Kasai, Kiyoshi; Kubota, Yoshitaka; and Tsukidate, Takaaki, 4,346,068, Cl. 423-344.000.
Tsukii, Toshikazu, to Raytheon Company. Radio frequency energy launcher. 4,346,355, Cl. 333-33.000.
Tsunoda, Masakazu: *See—*
Takagi, Kazumasa; and Tsunoda, Masakazu, 4,346,364, Cl. 340-52.00D.
Tsunoda, Sachio; and Sugishita, Kaneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of controlling operation of Francis type pump turbines. 4,346,304, Cl. 290-52.000.
Tsuzuki, Akira: *See—*
Koni, Tuyoshi; Urushida, Yoshihisa; and Tsuzuki, Akira, 4,345,612, Cl. 137-101.190.
Tu, Hosheng; and Rojo, Juana E., to UOP Inc. Process for use of a zeolite molecular sieve adsorbent in an aqueous system. 4,345,946, Cl. 127-46.300.
Tu Xuan, Mai; Jufer, Marcel; and Pittet, Andre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Movement detector for a stepping motor. 4,346,463, Cl. 368-157.000.
Tucci, John J.: *See—*
Sizemore, Ronald D.; Tucci, John J.; and Willette, Albert D., 4,345,889, Cl. 425-122.000.
Tuck, Philip C. Composition and process for stabilizing embankments. 4,345,856, Cl. 405-258.000.
Tuites, Richard C.: *See—*
Ponticello, Ignazio S.; Hollister, Kenneth R.; and Tuites, Richard C., 4,346,231, Cl. 560-178.000.
Tukuhiro, Tomoya: *See—*
Suzuki, Yoshinobu; Chiba, Kiyoshi; Tukuhiro, Tomoya; Iwasawa, Yoshiyuki; Kajioka, Yasuo; and Komine, Tomio, 4,345,431, Cl. 60-286.000.
Turanyi, Sandor. Apparatus for sealing an oil well pump polished rod. 4,345,766, Cl. 277-30.000.
Turchi, Peter J., to United States of America, Navy. Magnetoplasmadynamic switch. 4,346,420, Cl. 361-4.000.
Turner, Eugene D., to Briggs & Stratton Corporation. Lubrication system for rotary-trochoidal engines. 4,345,885, Cl. 418-90.000.
Turner, George F. A. M., to Ciba-Geigy AG. Film sheet cassette. 4,346,300, Cl. 206-455.000.
Turos, Sandor. Process for preparing crumb products. 4,346,121, Cl. 426-580.000.
Tyihak, Erno; Mincsovics, Emil; Dios, Sandor; Horvath, Gyula; Kalasz, Huba; Nagy, Janos; Kormendi, Ferenc; Kozma, Laszlo; Borsos, Janos; and Kiss, Janos, to Labor Muszeripari Muvek. Linear overpressured thin-layer chromatographic apparatus. 4,346,001, Cl. 210-198.300.
Tyler, Edward P.: *See—*
Hildreth, Donald M.; and Tyler, Edward P., 4,345,554, Cl. 123-179.0BG.
U.G. Closures & Plastics Limited: *See—*
Hopley, Eric T., 4,345,690, Cl. 215-216.000.
Uba, Toshio; Ching, Larry K. W.; and Harrison, Michael R., to Gates Rubber Company, The. Multicell sealed rechargeable battery. 4,346,151, Cl. 429-54.000.
Ueda, Minoru: *See—*
Fukasawa, Akira; and Ueda, Minoru, 4,345,987, Cl. 204-290.00R.
Ueda, Shigeo; and Fukuda, Yuji, to Bridgestone Tire Company Limited. Apparatus for restraining and berthing a floating body. 4,345,537, Cl. 114-219.000.
Uetsuji, Toshio: *See—*
Saito, Fumitoshi; Maeda, Sotomitsu; and Uetsuji, Toshio, 4,345,882, Cl. 417-312.000.
UHDE GmbH: *See—*
Faust, Uwe; Prave, Paul; Dorsemagen, Beate; and Hofer, Norbert, 4,346,113, Cl. 426-12.000.
Uhlmann, Otto: *See—*
Leuchs, Ottmar; Kloppner, Hans-Jurgen; and Uhlmann, Otto, 4,345,363, Cl. 29-527.400.
Ukeiley, Richard L.: *See—*
Blahut, Donald E.; and Ukeiley, Richard L., 4,346,437, Cl. 364-200.000.
Ulex, Georg A.: *See—*
Sattler, Henning; and Ulex, Georg A., 4,346,086, Cl. 424-243.000.
Ulin, Roy A., Jr.: *See—*
Hof, Craig R.; Ulin, Roy A., Jr.; and Polak, Robert B., 4,345,470, Cl. 374-106.000.
Umaba, Toshihiko; and Ito, Tadashi, to Dainippon Ink & Chemicals, Inc.; and Miyata Industry Company Limited. Powdery fire-extinguishing agent, and process for its preparation. 4,346,012, Cl. 252-7.000.
Union Carbide Corporation: *See—*
Cheung, Harry, 4,345,925, Cl. 62-13.000.
DeMatos, Henrique V., 4,346,429, Cl. 361-310.000.
Goddard, John B., 4,346,061, Cl. 423-56.000.
Somekh, George S.; and Cupper, Robert A., 4,346,015, Cl. 252-50.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Barter, Arthur J., 4,345,729, Cl. 244-169.000.
United Networks, Inc.: *See—*
Hestad, Alfred M.; and Rose, Levi L., 4,346,261, Cl. 179-1.0HF.
U.S. Industries, Inc.: *See—*
White, Charles A.; Kennedy, Jerome J.; and Wayne, Harold S., 4,345,682, Cl. 198-635.000.
United States of America
Agriculture: *See—*
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,346,043, Cl. 260-404.000.
Thompson, Malcolm J.; Mandava, Nagabhushanam; Worley, Joseph F., deceased; Meudt, Werner J.; Dutky, Samson R.; Robbins, William E.; and Flippen-Anderson, Judith L., 4,346,226, Cl. 549-268.000.
Air Force: *See—*
Villemain, Herbert F., 4,345,698, Cl. 220-452.000.
Army: *See—*
Curchack, Herbert D.; and Hahn, A. David, 4,345,460, Cl. 73-167.000.
Dawson, Stanley R.; and Hayes, Cecil L., 4,345,643, Cl. 165-122.000.
Devine, James A.; and Miletti, Jose A., 4,345,469, Cl. 73-338.600.
Roberts, Eugene L., 4,346,315, Cl. 307-603.000.
Wolfe, Neil M., 4,345,702, Cl. 222-630.000.
Health and Human Services: *See—*
Aronson, David L.; Tabor, Edward; and Gerety, Robert J., 4,346,073, Cl. 424-86.000.
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,346,224, Cl. 546-221.000.
Health, Education and Welfare: *See—*
Silberberg, Jeffrey L., 4,346,346, Cl. 324-132.000.
Navy: *See—*
Bartoli, Filbert J.; and Meyer, Jerry R., 4,346,348, Cl. 324-158.00R.
Turchi, Peter J., 4,346,420, Cl. 361-4.000.
U.S. Philips Corporation: *See—*
Alexis, Roger P. J., 4,346,475, Cl. 375-1.000.
Barten, Piet G. J., 4,346,327, Cl. 313-413.000.
Brockmann, Klaus-Dieter K.; and van Harreveld, Teunis A., 4,346,266, Cl. 179-170.0NC.
Dijkmans, Eise C., 4,346,267, Cl. 179-170.0NC.
Hovens, Paulus J. M., 4,346,400, Cl. 358-30.000.
United Technologies Corporation: *See—*
Hecht, Ralph J., 4,346,137, Cl. 428-215.000.
McFarlin, David J., 4,346,051, Cl. 264-102.000.
University of Delaware: *See—*
Islam, Mir N., 4,346,118, Cl. 426-335.000.
University of Liverpool: *See—*
Bornat, Alan; and Clarke, Roy M., 4,345,414, Cl. 53-425.000.
University of Rochester, The: *See—*
Craxton, Robert S., 4,346,314, Cl. 307-427.000.
University Patents Inc.: *See—*
Henkel, James G.; and Gianutsos, Gerald, 4,346,112, Cl. 424-325.000.
UOP Inc.: *See—*
Tu, Hosheng; and Rojo, Juana E., 4,345,946, Cl. 127-46.300.
Upjohn Company, The: *See—*
Aristoff, Paul A., 4,346,041, Cl. 549-498.000.
Burke, Howard J.; and Hessler, Edward J., 4,346,037, Cl. 260-239.55R.
Lednicer, Daniel, 4,346,101, Cl. 424-278.000.
Upjohn Manufacturing Company M, The: *See—*
Singer, Adam, 4,346,108, Cl. 424-317.000.
Urban, Otfried; and Mundt, Peter, to Geimuplast Peter Mundt GmbH & Co., KG. Method of automatically framing a reversal film provided with edge notches. 4,345,707, Cl. 226-68.000.
Urushida, Yoshihisa: *See—*
Koni, Tuyoshi; Urushida, Yoshihisa; and Tsuzuki, Akira, 4,345,612, Cl. 137-101.190.
Uyeda, Stanley T.; Radu, E. John; Talbot, William J., Jr.; and Feldman, Norman, to Santa Fe International Corporation. Self propelled dynamically positioned reel pipe laying ship. 4,345,855, Cl. 405-168.000.

Vacval, Dusan M., to International Harvester Co. Disc brake pad retractor. 4,345,674, Cl. 188-71.800.
Vail, Garry L.: *See—*
Buijs, Henry L.; Vail, Garry L.; and Berube, Jean-Noel, 4,345,838, Cl. 356-346.000.
Vakil, Himanshu B.; and Kosky, Philip G., to General Electric Company. Mixed feed evaporator. 4,345,915, Cl. 48-197.00R.
Valantin, Alfred, to Techniques Industrielles et Minieres, a part interest. Apparatus for laying underwater pipelines. 4,345,854, Cl. 405-159.000.
Van Craenenbroeck, Raymond J. E. Safety device for a heat exchange equipment filled with pressurized liquid. 4,345,715, Cl. 237-66.000.
van den Heuvel, Eeuwoud: *See—*
de Groot, Hans; van den Heuvel, Eeuwoud; Barendrecht, Embrecht; and Janssen, Leonard J. J., 4,345,978, Cl. 204-74.000.
VanDewoestine, Robert V.: *See—*
Allaire, Roger A.; and VanDewoestine, Robert V., 4,345,528, Cl. 110-203.000.
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Walden, John P., to General Electric Company. Frequency shift inverter for variable power control. 4,346,332, Cl. 315-307.000.
Wallace, Harry L.; and Chambors, John M., to Burroughs Corporation. Matrix printer employing a special character font. 4,346,393, Cl. 346-140.00R.
Walling, John B. Connector assembly for flexible production tubing. 4,345,784, Cl. 285-39.000.
Walter, John, to Continental Group, Inc., The. Container closure device. 4,345,701, Cl. 222-569.000.
Walton, Robert R.; and Edwards, Finis E., to Wellman Thermal Systems Corporation. Soft wall hanger for furnace. 4,346,252, Cl. 373-130.000.
Wan, Jeffrey K. S., to Queen's University at Kingston. Method for disposal of chemical waste. 4,345,983, Cl. 204-158.00R.
Wang, Austin. Moving target means of shooting gallery. 4,345,765, Cl. 273-359.000.
Wardell, Myron H., Jr., to RCA Corporation. Electron tube base with flow channels therein. 4,345,812, Cl. 339-144.00R.
Warfel, David R., to Atlantic Richfield Company. Continuous process for making star-block copolymers. 4,346,193, Cl. 525-52.000.
Warner, Gary J.; and Feifel, Winfried M., to Boeing Company, The. Flap flexure retainer/seal for hydrofoil vessels and the like. 4,345,538, Cl. 114-274.000.
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Warren, Dwight D. Contractor's grade rod apparatus and procedure for setting and checking grades. 4,345,382, Cl. 33-294.000.
Warthen, Daniel E. Flexible drill chuck drive. 4,345,445, Cl. 279-62.000.
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Weber, Hermann P. Apparatus for coating items. 4,345,546, Cl. 118-675.000.

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Weir, Henry J. Laundry feeding machine. 4,345,391, Cl. 38-143.000.

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White, Charles A.; Kennedy, Jerome J.; and Wayne, Harold S., to U.S. Industries, Inc. Egg transporting system. 4,345,682, Cl. 198-635.000.

White, Forest B. Governor for fluid current motor. 4,346,305, Cl. 290-55.000.

Whitesides, Roger H., Jr., to Thiokol Corporation. Rocket motor or gas generator having controlled thrust or mass flow output. 4,345,427, Cl. 60-234.000.

Whitney, Douglass G.; and Martin, John K., III. Piezoelectric fluid injector. 4,345,595, Cl. 128-214.00F.

Widder, Kenneth J.; and Senyei, Andrew E., to Northwestern University. Method of delivering a therapeutic agent to a target capillary bed. 4,345,588, Cl. 128-1.300.

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Wilcox, Milton E., to National Semiconductor Corporation. High frequency voltage-controlled oscillator. 4,346,351, Cl. 331-117.00R.

Wiley, Robert A., to Mead Corporation, The. Ink jet fluid supply system. 4,346,388, Cl. 346-75.000.

Wilhelmson, Jack. Electronic circuit for sensing deviations in physical forces thereon. 4,346,363, Cl. 340-27.00R.

Wilkinson, Samuel, to Burroughs Wellcome Co. Biologically active amides. 4,346,083, Cl. 424-177.000.

Wilkinson, William R.; Sharp, Russell G.; Reed, Charles C.; Cooley, Denton A.; and Crane, Terry N., to Texas Medical Products, Inc. Degasser for biological fluids. 4,345,919, Cl. 55-41.000.

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Wilson, Wayne; Rosko, George; and Patmore, James R., to Electronic Associates, Inc. On-line gas measurement and analysis system. 4,345,463, Cl. 73-190.0CV.

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Wise, John B., to Burroughs Corporation. Pipelined interpretive digital data processor comprised of a multi-level hierarchy of processors. 4,346,435, Cl. 364-200.000.

Wise, John B., to Burroughs Corporation. Interpretive digital data processor comprised of a multi-level hierarchy of processors and having program protection means. 4,346,436, Cl. 364-200.000.

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Wojtecki, Rudolph G.; and Kaan, Joseph P., to Eaton Corporation. Packaged electrical heating element. 4,346,277, Cl. 219-528.000.

Wolcott, Edward O.; and Wentzel, Frank W., Jr., to General Electric Company. Method and apparatus for preparing lead-acid battery pastes. 4,346,022, Cl. 252-509.000.

Wolfe, Neil M., to United States of America, Army. Fiber disseminator. 4,345,702, Cl. 222-630.000.

Wong, Robert W.; and Haines, Richard M., to Owens-Corning Fiberglas Corporation. Non-aging epoxy compatible size. 4,346,026, Cl. 524-157.000.

Wood, Laurier A.; and Humphries, Donald N., to Laurier Associates, Inc. Method of applying an adhesive to a circuit chip. 4,346,124, Cl. 427-82.000.

Woodbrey, James C., to Monsanto Company. Thermoplastic polyamide compositions. 4,346,200, Cl. 525-421.000.

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Woody, Albert L.; Fox, Lawrence E.; and Reinsma, Harold L., to Caterpillar Tractor Co. Constant strain boot seal. 4,345,772, Cl. 277-212.0FB.

Woolcock, Sydney C.; and Brown, Edwin G., to EMI Limited. Checking the location of moving parts in a machine. 4,346,383, Cl. 343-12.00R.

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Wossner, Felix; Handke, Gunther; and Koller, Manfred, to Fichtel & Sachs AG. Fluid damped unit, particularly for use as shock absorber or telescopic strut. 4,345,748, Cl. 267-8.00R.

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Growdon, John H.; and Wurtman, Richard J., 4,346,085, Cl. 424-199.000.

Wymore, Roger S. Material handling vehicle. 4,345,873, Cl. 414-714.000.

Wysk, Stanley R.; and Palkes, Mark, to Combustion Engineering, Inc. Apparatus for retrofitting an existing steam generator with an MHD topping unit. 4,346,316, Cl. 310-11.000.
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Yasuhara, Seishi, to Nissan Motor Co., Ltd. Soot treatment device for a Diesel engine. 4,345,429, Cl. 60-279.000.
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Chow, Richard T.; Krauss, Clifford J.; and Ybema, Douwe, 4,345,980, Cl. 204-119.000.
Yeazel, Howard T.: *See*—
Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., 4,346,396, Cl. 357-70.000.
Yeda Research and Development Co. Ltd.: *See*—
Shtrikman, Shmuel, 4,346,318, Cl. 310-12.000.
Yen, Huan-Wun: *See*—
Figueroa, Luis; and Yen, Huan-Wun, 4,346,394, Cl. 357-30.000.
Yoda, Haruo; and Motoike, Jun, to Hitachi, Ltd. Visual information processing apparatus. 4,346,405, Cl. 358-105.000.
Yokota, Kouji: *See*—
Oshima, Yujiro; Fujitani, Yoshiyasu; Muraki, Hideaki; Kondoh, Shiroh; and Yokota, Kouji, 4,345,555, Cl. 123-272.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Multichannel audio power amplifier. 4,346,349, Cl. 330-10.000.
Yokozawa, Shunya: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,346,206, Cl. 528-88.000.
Yoldas, Bulent E., to Westinghouse Electric Corp. Polymerized solutions for depositing optical oxide coatings. 4,346,131, Cl. 428-35.000.
Yoldas, Bulent E., to Westinghouse Electric Corp. Heat mirror for incandescent lamp. 4,346,324, Cl. 313-112.000.
Yoneyama, Kunihiko: *See*—
Saito, Yasunori; Nakagaki, Kunihiro; Yoneyama, Kunihiko; and Ohmoto, Katsumi, 4,346,253, Cl. 174-29.000.
Yoshida, Hirofumi: *See*—
Nakamura, Toshikazu; and Yoshida, Hirofumi, 4,346,285, Cl. 219-381.000.
Yoshida, Hitoshi: *See*—
Hattori, Tadashi; Mukainakano, Siniti; and Yoshida, Hitoshi, 4,345,569, Cl. 123-549.000.
Yoshida, Kiyoshi: *See*—
Nakada, Akira; Okamoto, Eisaku; and Yoshida, Kiyoshi, 4,345,501, Cl. 84-1.030.
Yoshida, Seiki: *See*—
Ikeda, Hironosuke; Oishi, Hisao; and Yoshida, Seiki, 4,345,611, Cl. 137-68.00R.
Yoshii, Hiroe: *See*—
Akashi, Kunihiko; Nakamura, Yayoi; Tsuchida, Takayasu; Yoshii, Hiroe; and Ikeda, Shigeho, 4,346,169, Cl. 435-114.000.
Yoshii, Nobuo: *See*—
Ogino, Etsuo; Yoshii, Nobuo; and Harada, Kazuo, 4,346,010, Cl. 210-714.000.
Yoshimi, Yasuhito: *See*—
Nomura, Norimasa; and Yoshimi, Yasuhito, 4,345,832, Cl. 354-320.000.
Yoshimura, Hidenaga; Yamada, Kunio; Yamada, Hironori; Yamada, Ryusaku; and Kudo, Hiroaki, to Toray Monofilament Company Limited; and Osaka City Government. Medical vascular guide wire and self-guilding type catheter. 4,345,602, Cl. 128-349.00R.
Yoshino, Kenji: *See*—
Goto, Fumio; Yoshino, Kenji; Kono, Hiroshi; and Naito, Mitsuaki, 4,345,852, Cl. 404-114.000.
Yoshioka, Mitsuru: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,346,218, Cl. 544-16.000.
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Passive seatbelt system for motor vehicles. 4,345,782, Cl. 280-803.000.
Young, Charles L., Jr.; and Gray, Ralph C., to PPG Industries, Inc. Method of applying zinc-rich primer and product. 4,346,143, Cl. 428-332.000.
Young, Janis Marie: *See*—
Young, Ruperto S., 4,345,596, Cl. 128-214.00R.
Young, Kenneth P.: *See*—
Flemings, Merton C.; Riek, Rodney G.; and Young, Kenneth P., 4,345,637, Cl. 164-113.000.
Young, Ruperto S., to Young, Janis Marie; and Wessendorf, Roberta H. Arterial catherization device. 4,345,596, Cl. 128-214.00R.
Yugen Kaisha Shinjoseisakusho: *See*—
Shinjo, Katsumi, 4,345,677, Cl. 193-2.00A.
Zanarini, Franco, to Safe S.r.l. Multi-stage, reciprocating, positive displacement compressor. 4,345,880, Cl. 417-264.000.
Zanutti, Hugo A. Vessel location system. 4,345,462, Cl. 73-178.00R.
Zaruba, John V.: *See*—
Katzman, Allison W.; Holahan, Edward T.; Zaruba, John V.; and Morrison, Howard J., 4,345,400, Cl. 46-4.000.
Zengel, Hans G.; Bergfeld, Manfred F.; and Zielke, Rainer, to Akzona Incorporated. Process for the preparation of ureas. 4,346,233, Cl. 562-439.000.
Zenith Radio Corporation: *See*—
Lai, Stephen, 4,346,398, Cl. 358-20.000.
Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Solenoid operated valve and dashpot assembly. 4,345,736, Cl. 251-30.000.
Zielke, Rainer: *See*—
Zengel, Hans G.; Bergfeld, Manfred F.; and Zielke, Rainer, 4,346,233, Cl. 562-439.000.
Zimmerman, Donald R., to Crane Co. Tube settler module. 4,346,005, Cl. 210-232.000.
Zinn, Thomas K.: *See*—
Longiny, Michael A.; Kalchev, Dimitar; and Zinn, Thomas K., 4,345,884, Cl. 417-359.000.
Zitz, Alfred: *See*—
Droescher, Bernhard; and Zitz, Alfred, 4,345,839, Cl. 356-400.000.
Zobac, Ladislav; Malek, Zdenek; Soukup, Frantisek; Ryska, Antonin; Jelinek, Jan; and Busta, Jiri, to Vyzkumny ustav Silnoproude Elektrotechniky. Cryogenic apparatus for surgery. 4,345,598, Cl. 128-303.100.
Zulaski, John A., to S & C Electric Company. Voltage-unbalance detector for polyphase electrical systems. 4,346,307, Cl. 307-130.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF AUGUST, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bedford Industries, Inc.: *See*—
Moore, Doyle A., Re. 31,015, Cl. 242-71.900.

Bel Fuse Inc.: *See*—
Bernstein, Elliot, Re. 31,017, Cl. 339-147.00P.

Bernstein, Elliot, to Bel Fuse Inc. Method for fusing male plug at end of power line cord. Re. 31,017, Cl. 339-147.00P.

Conoco Inc.: *See*—
Oster, Clarence, Re. 31,016, Cl. 308-4.00A.

Harrington, John H.; Smyth, Richard T.; and Weir, John D., to Metco Inc. Method and apparatus for shielding the effluent from plasma spray gun assemblies. Re. 31,018, Cl. 219-121.0PL.

Metco Inc.: *See*—
Harrington, John H.; Smyth, Richard T.; and Weir, John D., Re. 31,018, Cl. 219-121.0PL.

Moore, Doyle A., to Bedford Industries, Inc. Reel adapter for tie material and method of using same. Re. 31,015, Cl. 242-71.900.

Oster, Clarence, to Conoco Inc. Anti-friction sucker rod guide assembly. Re. 31,016, Cl. 308-4.00A.

Smyth, Richard T.: *See*—
Harrington, John H.; Smyth, Richard T.; and Weir, John D., Re. 31,018, Cl. 219-121.0PL.

Weir, John D.: *See*—
Harrington, John H.; Smyth, Richard T.; and Weir, John D., Re. 31,018, Cl. 219-121.0PL.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
D'Alo, Herbert F., 265,926, Cl. D24-27.000.

Acrylic Creations, Inc.: *See*—
Margulis, Craig S., 265,867, Cl. D3-78.000.

Allison, Monte C.; and Graves, Kenneth M. Tool caddy. 265,941, 8-24-82, Cl. D34-44.000.

American Standard Inc.: *See*—
Simpson, Linda S., 265,929, Cl. D25-48.000.
Simpson, Linda S., 265,930, Cl. D25-48.000.
Simpson, Linda S., 265,931, Cl. D25-48.000.
Simpson, Linda S., 265,932, Cl. D25-48.000.
Simpson, Linda S., 265,933, Cl. D25-48.000.

Aoijs, Dieudonne G., to U.S. Philips Corporation. Radio receiver. 265,904, 8-24-82, Cl. D14-70.000.

Aqualine Products Limited: *See*—
Littlefield, Reg, 265,876, Cl. D6-101.000.
Littlefield, Reg, 265,883, Cl. D8-351.000.

Barr, Josef J. Pearl earring. 265,894, 8-24-82, Cl. D11-43.000.

Barr, Josef J. Earring. 265,895, 8-24-82, Cl. D11-76.000.

Bechtel, Daniel L. Base for a rifle telescope mount. 265,920, 8-24-82, Cl. D22-7.000.

Bell, Ronald; and Sorensen, Jorn, to Force 10 Marine Ltd. Barbecue. 265,881, 8-24-82, Cl. D7-110.000.

Berteloot, Joseph W. Antfarm. 265,937, 8-24-82, Cl. D30-1.000.

Bisso, Helen, to Bisso, Paul. Cake baking frame. 265,879, 8-24-82, Cl. D7-43.000.

Bisso, Paul: *See*—
Bisso, Helen, 265,879, Cl. D7-43.000.

Black & Decker Inc.: *See*—
House, Lawrence E., II, 265,899, Cl. D13-5.000.

Bogner, Richard D.; and King, Leonard H. Microwave antenna. 265,905, 8-24-82, Cl. D14-86.000.

C & D Consulting & Design AG: *See*—
Luthy, Ernst, 265,869, Cl. D6-63.000.

Caldwell, John W. Pole-mounted sun shade. 265,862, 8-24-82, Cl. D3-5.000.

Canon Kabushiki Kaisha: *See*—
Yoshioka, Eiichi; and Fushimoto, Hideo, 265,913, Cl. D18-7.000.

Caputo, Louise, to Faberge, Incorporated. Box. 265,886, 8-24-82, Cl. D9-332.000.

Cerkovnik, Andrej; and Zvanut, Stane. Board for water sports. 265,898, 8-24-82, Cl. D12-303.000.

Clorox Company, The: *See*—
Weckman, Richard L., 265,887, Cl. D9-375.000.

Consolidated Foods Corporation: *See*—
Lawrence, James L.; and Heller, Joel, 265,889, Cl. D9-418.000.

Craig, Thomas M. Beverage can holder. 265,880, 8-24-82, Cl. D7-70.000.

Cuttriss, Richard J., to Gruber Systems, Inc. Bathtub. 265,923, 8-24-82, Cl. D23-55.000.

D'Alo, Herbert F., to Abbott Laboratories. Grippable tubing clamp or the like. 265,926, 8-24-82, Cl. D24-27.000.

Dart Industries Inc.: *See*—
Lahay, Charles A., 265,927, Cl. D24-59.000.

Eberbach, Steven J. Speaker cabinet. 265,902, 8-24-82, Cl. D14-33.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 265,916, Cl. D19-91.000.

Ellersick, Russell R. Quartz halide lamp reflector-heat concentrator. 265,934, 8-24-82, Cl. D26-118.000.

Epperson, Charles N. Oil container or the like. 265,888, 8-24-82, Cl. D9-375.000.

Evenson, Mel, to Eldon Industries, Inc. Foldable stenographic notebook holder. 265,916, 8-24-82, Cl. D19-91.000.

Faberge, Incorporated: *See*—
Caputo, Louise, 265,886, Cl. D9-332.000.

Fallen, Floyd F.; and Wilson, Calvin L., to Reynolds Metals Company. Carton blank. 265,890, 8-24-82, Cl. D9-433.000.

Feuchs, Walter F. Building structure. 265,928, 8-24-82, Cl. D25-18.000.

Force 10 Marine Ltd.: *See*—
Bell, Ronald; and Sorensen, Jorn, 265,881, Cl. D7-110.000.

Frenkel, Juergen, to Veb Werkzeugmaschinenkombinat "7 Oktober". Machine tool enclosure. 265,912, 8-24-82, Cl. D15-138.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Klose, Odo, 265,874, Cl. D6-86.000.

Fushimoto, Hideo: *See*—
Yoshioka, Eiichi; and Fushimoto, Hideo, 265,913, Cl. D18-7.000.

Gageby, Steven D. Chair. 265,871, 8-24-82, Cl. D6-76.000.

Gardisette International AG: *See*—
Stocker, Hans, 265,942, Cl. D47-6.00E.
Stocker, Hans, 265,943, Cl. D47-6.00E.

Gebhardt, James L.; and Hutchins, Ferris L., Jr., to Mead Corporation, The. Sports scoreboard. 265,892, 8-24-82, Cl. D10-46.100.

Gehlke, Stephen J. S., to Ion Systems, Inc. Air ionizer. 265,924, 8-24-82, Cl. D23-150.000.

General Mills Products Corp.: *See*—
Stephens, James R.; and Grieve, Margaret, 265,865, Cl. D3-56.000.

Gerber, Gary A. Car top ski carrier. 265,897, 8-24-82, Cl. D12-157.000.

GK Haninge Maskiner AB: *See*—
Karlsson, Gustaf, 265,907, Cl. D15-12.000.

Graves, Kenneth M.: *See*—
Allison, Monte C.; and Graves, Kenneth M., 265,941, Cl. D34-44.000.

Grieve, Margaret: *See*—
Stephens, James R.; and Grieve, Margaret, 265,865, Cl. D3-56.000.

Gruber Systems, Inc.: *See*—
Cuttriss, Richard J., 265,923, Cl. D23-55.000.
Jasperson, Stephen J., 265,922, Cl. D23-55.000.

Hamaguchi, Masahiko; and Sato, Yasuhiro, to Tomy Kogyo Company, Inc. Housing for amusement water toy. 265,917, 8-24-82, Cl. D21-59.000.

Hardy, Bruce N., to Silver Street, Incorporated. Drumstick holder. 265,877, 8-24-82, Cl. D6-125.000.

Hatanaka, Takefumi, to Lifewell Corporation. Paper shredder or the like. 265,909, 8-24-82, Cl. D15-127.000.

Hatanaka, Takefumi, to Lifewell Corporation. Paper shredder or the like. 265,910, 8-24-82, Cl. D15-127.000.

Hatanaka, Takefumi, to Lifewell Corporation. Paper shredder or the like. 265,911, 8-24-82, Cl. D15-127.000.

Heller, Joel: *See*—
Lawrence, James L.; and Heller, Joel, 265,889, Cl. D9-418.000.

Hiraishi, Etsuo; and Sakamoto, Masakazu, to Ryobi Limited. Printing machine. 265,914, 8-24-82, Cl. D18-13.000.

Holschneider, Johannes P. Convertible rocking chair. 265,868, 8-24-82, Cl. D6-3.000.

House, Lawrence E., II, to Black & Decker Inc. Battery charger system. 265,899, 8-24-82, Cl. D13-5.000.

Hutchins, Ferris L., Jr.: *See—*
Gebhardt, James L.; and Hutchins, Ferris L., Jr., 265,892, Cl. D10-46.100.

Hutz, John A., to Uniroyal, Inc. Pneumatic tire tread and buttress. 265,896, 8-24-82, Cl. D12-143.000.

International Business Machines Corp.: *See—*
Steinbugler, Robert E., 265,906, Cl. D14-107.000.

Ion Systems, Inc.: *See—*
Gehlke, Stephen J. S., 265,924, Cl. D23-150.000.

Jasperson, Stephen J., to Gruber Systems, Inc. Bathtub. 265,922, 8-24-82, Cl. D23-55.000.

Johnson, William H., to Shenandoah Manufacturing Co., Inc. Static pressure control assembly for environmentally controlled buildings and the like. 265,900, 8-24-82, Cl. D13-12.000.

Karlsson, Gustaf, to GK Haninge Maskiner AB. Snow plow snow retaining gate. 265,907, 8-24-82, Cl. D15-12.000.

Kilham, Peter. Wood burning stove. 265,921, 8-24-82, Cl. D23-97.000.

Kilham, Peter. Bird feeder perch. 265,938, 8-24-82, Cl. D30-13.000.

Kilham, Peter. Window bird feeder. 265,939, 8-24-82, Cl. D30-14.000.

King, Leonard H.: *See—*
Bogner, Richard D.; and King, Leonard H., 265,905, Cl. D14-86.000.

Klose, Odo, to Friedrich Grohe Armaturenfabrik GmbH & Co. Support for a hand-held showerhead. 265,874, 8-24-82, Cl. D6-86.000.

Kracke, Donald R. Tote bag with attached pouch. 265,864, 8-24-82, Cl. D3-43.000.

Lahay, Charles A., to Dart Industries Inc. Urine collection device or the like. 265,927, 8-24-82, Cl. D24-59.000.

Lawrence, James L.; and Heller, Joel, to Consolidated Foods Corporation. Brassiere display package. 265,889, 8-24-82, Cl. D9-418.000.

Levin, Gary M. Jewelry box. 265,866, 8-24-82, Cl. D3-66.000.

Lifewell Corporation: *See—*
Hatanaka, Takefumi, 265,909, Cl. D15-127.000.
Hatanaka, Takefumi, 265,910, Cl. D15-127.000.
Hatanaka, Takefumi, 265,911, Cl. D15-127.000.

Littlefield, Reg, to Aqualine Products Limited. Towel rack. 265,876, 8-24-82, Cl. D6-101.000.

Littlefield, Reg, to Aqualine Products Limited. Wall plate. 265,883, 8-24-82, Cl. D8-351.000.

Luthy, Ernst, to C & D Consulting & Design AG. Sofa. 265,869, 8-24-82, Cl. D6-63.000.

Mabry Industries, Inc.: *See—*
Mabry, James B., 265,884, Cl. D8-354.000.

Mabry, James B., to Mabry Industries, Inc. Vibration dampening bracket for a take-up cradle of a yarn texturing machine. 265,884, 8-24-82, Cl. D8-354.000.

Margulis, Craig S., to Acrylic Creations, Inc. Transparent lock box. 265,867, 8-24-82, Cl. D3-78.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Miki, Kunishige, 265,90', Cl. D14-6.000.

McCarn, Ellen D., to McCarn Enterprises, Inc. Sewing thread organizer. 265,863, 8-24-82, Cl. D3-23.000.

McCarn Enterprises, Inc.: *See—*
McCarn, Ellen D., 265,863, Cl. D3-23.000.

Mead Corporation, The: *See—*
Gebhardt, James L.; and Hutchins, Ferris L., Jr., 265,892, Cl. D10-46.100.

Miki, Kunishige, to Matsushita Electric Industrial Co., Ltd. Portable cassette tape recorder. 265,901, 8-24-82, Cl. D14-6.000.

Olsson, Sven O. Paint roller cleaner. 265,940, 8-24-82, Cl. D32-46.000.

Pearson, Clark: *See—*
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,875, Cl. D6-86.000.

Pinnacle Furniture Company, Inc.: *See—*
Wistehuff, Daniel D., 265,870, Cl. D6-68.000.
Wistehuff, Daniel D., 265,878, Cl. D6-146.000.

Rekow, John A. Apparel display rack. 265,872, 8-24-82, Cl. D6-85.000.

Reynolds Metals Company: *See—*
Fallen, Floyd F.; and Wilson, Calvin L., 265,890, Cl. D9-433.000.

Ryobi Limited: *See—*
Hiraishi, Etsuo; and Sakamoto, Masakazu, 265,914, Cl. D18-13.000.

Sakamoto, Masakazu: *See—*
Hiraishi, Etsuo; and Sakamoto, Masakazu, 265,914, Cl. D18-13.000.

Sammons, Michael F. Carton blank. 265,891, 8-24-82, Cl. D9-433.000.

Sandman, Scott: *See—*
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,875, Cl. D6-86.000.

Sankin Kogyo Kabushiki Kaisha: *See—*
Yogosawa, Fumio, 265,925, Cl. D24-16.000.

Sato, Yasuhiro: *See—*
Hamaguchi, Masahiko; and Sato, Yasuhiro, 265,9.7, Cl. D21-59.000.

Schneider, Eric A., to Singer Company, The. Sewing machine bracket arm. 265,908, 8-24-82, Cl. D15-76.000.

Schoch, Robert R. Toy airplane. 265,918, 8-24-82, Cl. D21-89.000.

Shenandoah Manufacturing Co., Inc.: *See—*
Johnson, William H., 265,900, Cl. D13-12.000.

Sher, Robert B. Pipe. 265,935, 8-24-82, Cl. D27-03.000.

Sher, Robert B. Pipe. 265,936, 8-24-82, Cl. D27-03.000.

Shih, Wen-I. Supporting frame for gas stove. 265,882, 8-24-82, Cl. D7-130.000.

Silver Street, Incorporated: *See—*
Hardy, Bruce N., 265,877, Cl. D6-125.000.

Simpson, Linda S., to American Standard Inc. Door. 265,929, 8-24-82, Cl. D25-48.000.

Simpson, Linda S., to American Standard Inc. Door. 265,930, 8-24-82, Cl. D25-48.000.

Simpson, Linda S., to American Standard Inc. Door. 265,931, 8-24-82, Cl. D25-48.000.

Simpson, Linda S., to American Standard Inc. Door. 265,932, 8-24-82, Cl. D25-48.000.

Simpson, Linda S., to American Standard Inc. Door. 265,933, 8-24-82, Cl. D25-48.000.

Singer Company, The: *See—*
Schneider, Eric A., 265,908, Cl. D15-76.000.

Smith, Aziza. Slacks. 265,860, 8-24-82, Cl. D2-28.000.

Smith, Ivan A., to Village Nominees Pty. Ltd. Curtain track end pulley. 265,885, 8-24-82, Cl. D8-358.000.

Smith, Larry C. Guitar stand. 265,873, 8-24-82, Cl. D6-85.000.

Sorensen, Jorn: *See—*
Bell, Ronald; and Sorensen, Jorn, 265,881, Cl. D7-110.000.

Spiecker, Klaus W. Square puzzle. 265,919, 8-24-82, Cl. D21-104.000.

Steinbugler, Robert E., to International Business Machines Corp. Modem. 265,906, 8-24-82, Cl. D14-107.000.

Stephens, James R.; and Grieve, Margaret, to General Mills Products Corp. Foldable packet for storing and displaying a jewelry article. 265,865, 8-24-82, Cl. D3-56.000.

Stocker, Hans, to Gardisette International AG. Curtain material. 265,942, 8-24-82, Cl. D47-6.00E.

Stocker, Hans, to Gardisette International AG. Curtain material. 265,943, 8-24-82, Cl. D47-6.00E.

Tappan Company, The: *See—*
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,875, Cl. D6-86.000.

Tivey, Mary. Watercolor palette. 265,915, 8-24-82, Cl. D19-35.000.

Tomy Kogyo Company, Inc.: *See—*
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Uniroyal, Inc.: *See—*
Hutz, John A., 265,896, Cl. D12-143.000.

U.S. Philips Corporation: *See—*
Aoijs, Dieudonne G., 265,904, Cl. D14-70.000.

Veb Werkzeugmaschinenkombinat "7 Oktober": *See—*
Frenkel, Juergen, 265,912, Cl. D15-138.000.

Village Nominees Pty. Ltd.: *See—*
Smith, Ivan A., 265,885, Cl. D8-358.000.

Walasek, Stanley. Armband identification passholder with a transparent front face. 265,861, 8-24-82, Cl. D2-402.000.

Weckman, Richard L., to Clorox Company, The. Bottle. 265,887, 8-24-82, Cl. D9-375.000.

Wendorff, Erwin R. Telephone. 265,903, 8-24-82, Cl. D14-53.000.

Whiting, Donald H. Combined modular flower box and tray therefor. 265,893, 8-24-82, Cl. D11-156.000.

Wilson, Calvin L.: *See—*
Fallen, Floyd F.; and Wilson, Calvin L., 265,890, Cl. D9-433.000.

Wistehuff, Daniel D., to Pinnacle Furniture Company, Inc. Chair. 265,870, 8-24-82, Cl. D6-68.000.

Wistehuff, Daniel D., to Pinnacle Furniture Company, Inc. Table. 265,878, 8-24-82, Cl. D6-146.000.

Wolf, Gregory; Sandman, Scott; and Pearson, Clark, to Tappan Company, The. Shower or tub storage cabinet. 265,875, 8-24-82, Cl. D6-86.000.

Word, Robert F. Combined toy bank and ash tray. 265,944, 8-24-82, Cl. D99-36.000.

Yogosawa, Fumio, to Sankin Kogyo Kabushiki Kaisha. Occludator. 265,925, 8-24-82, Cl. D24-16.000.

Yoshioka, Eiichi; and Fushimoto, Hideo, to Canon Kabushiki Kaisha. Desk top electronic calculator. 265,913, 8-24-82, Cl. D18-7.000.

Zvanut, Stane: *See—*
Cerkovnik, Andrej; and Zvanut, Stane, 265,898, Cl. D12-303.000.

LIST OF PLANT PATENTEES

Kirsch, Ted T., to Sun Valley Bulb Farms, Inc. Lily named Escort. 4,880, 8-24-82, Cl. 68.000.

Kirsch, Ted T., to Sun Valley Bulb Farms, Inc. Lily named Laura. 4,881, 8-24-82, Cl. 68.000.

McRae, Edward A. Lily plant: Lilium 'Matchless'. 4,879, 8-24-82, Cl. 68.000.

Sun Valley Bulb Farms, Inc.: *See—*
Kirsch, Ted T., 4,880, Cl. 68.000.
Kirsch, Ted T., 4,881, Cl. 68.000.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

161 A 4,345,335
187 4,345,336
405 4,345,337
414 4,345,338

CLASS 3

1 4,345,339
1.5 4,345,340

CLASS 4

301 4,345,341
4,345,342
662 4,345,343

CLASS 5

62 4,345,344
437 4,345,345
4,345,346
441 4,345,347
4,346,298
450 4,345,348

CLASS 8

111 4,345,908
444 4,345,907
477 4,345,909
610 4,345,910

CLASS 15

104.06 R 4,345,350
144 B 4,345,351
250.16 4,345,352
349 4,345,353

CLASS 16

257 4,345,354

CLASS 19

0.6 4,345,355
200 4,345,356

CLASS 23

230 B 4,345,911
230 EP 4,345,912
230 R 4,345,913

CLASS 26

18.5 4,345,357

CLASS 29

14 4,345,358
25.35 4,345,359
159.01 4,345,360
237 4,345,361
426.5 4,345,362
527.4 4,345,363
571 4,345,364
4,345,365
4,345,366
603 4,345,367
611 4,345,368
622 4,345,369
828 4,345,370
836 4,345,371
874 4,345,372
4,345,373

CLASS 30

47 4,345,374
90.1 4,345,375
96 4,345,376
181 4,345,377
266 4,345,378

CLASS 33

21 R 4,345,379
147 N 4,345,380
174 G 4,345,381
294 4,345,382
474 4,345,383

CLASS 34

16.5 4,345,384
23 4,345,385
218 4,345,386

CLASS 36

43 4,345,387

CLASS 37

195 4,345,388

CLASS 38

77.7 4,345,389
102.91 4,345,390
143 4,345,391

CLASS 40

116 4,345,392
312 4,345,393
405 4,345,394
441 4,345,395
490 4,345,396

CLASS 42

42 B 4,345,397
94 4,345,398

CLASS 43

42.06 4,345,399

CLASS 44

10 C 4,345,914

CLASS 46

4 4,345,400
79 4,345,401
206 4,345,402

CLASS 47

1.1 4,345,403
8 4,345,404
10 4,345,405

CLASS 48

197 R 4,345,915

CLASS 52

8 4,345,406
169.3 4,345,407
4,345,408
693 4,345,409
741 4,345,410

CLASS 53

134 4,345,411
297 4,345,412
315 4,345,413
425 4,345,414
450 4,345,415

CLASS 55

5 4,345,916
33 4,345,917
38 4,345,918
41 4,345,919
46 4,345,920
223 4,345,921
302 4,345,922
314 4,345,923
379 4,345,924

CLASS 56

13.3 4,345,416
14.3 4,345,417
202 4,345,418
249 4,345,419
295 4,345,420
341 4,345,421
370 4,345,422

CLASS 57

58.84 4,345,423
209 4,345,424
289 4,345,425

CLASS 60

39.23 4,345,426
234 4,345,427
274 4,345,428
279 4,345,429
282 4,345,430
286 4,345,431
290 4,345,432
327 4,345,433
398 4,345,434
420 4,345,435
421 4,345,436
521 4,345,437
657 4,345,438

CLASS 62

13 4,345,925
38 4,345,926
71 4,345,439
116 4,345,440
140 4,345,441
160 4,345,442
380 4,345,443

CLASS 63

4 4,345,444

CLASS 65

4.4 4,345,927
18.2 4,345,928
99.5 4,345,929
102 4,345,930

CLASS 66

9 B 4,345,446

CLASS 70

38 A 4,345,447
95 4,345,448
153 4,345,449

CLASS 71

28 4,345,931
88 4,345,932
4,345,933
92 4,345,934
4,345,935
4,345,936
95 4,345,937
118 4,345,938

CLASS 72

273.5 4,345,450
286 4,345,451
452 4,345,452
453.18 4,345,453

CLASS 73

1 E 4,345,454
32 A 4,345,456
37.5 4,345,457
4,345,458
61.1 R 4,345,459
167 4,345,460
170 A 4,345,461
178 R 4,345,462
190 CV 4,345,463
201 4,345,464
204 4,345,465
298 4,345,466
309 4,345,467
326 4,345,468
338.6 4,345,469
462 4,345,472
516 LM 4,345,473
517 B 4,345,474
657 4,345,475
720 4,345,476
766 4,345,477
861.09 4,345,478
861.28 4,345,479
861.77 4,345,480
862.34 4,345,481
862.59 4,345,482
864.16 4,345,483
864.43 4,345,484

CLASS 74

5.1 4,345,485
198 4,345,486
563 4,345,487
682 4,345,488
752 A 4,345,489
761 4,345,490
831 4,345,491

CLASS 75

41 4,345,939
58 4,345,940
122 4,345,941
237 4,345,942
238 4,345,943

CLASS 76

101 R 4,345,492

CLASS 81

57.34 4,345,493
64 4,345,494

CLASS 82

41 4,345,495

CLASS 83

100 4,345,496
105 4,345,497
707 4,345,498
835 4,345,499

CLASS 84

1.01 4,345,500
1.03 4,345,501
1.21 4,345,502
383 R 4,345,503

CLASS 89

37 GM 4,345,504
154 4,345,505

CLASS 91

376 R 4,345,506
449 4,345,507
516 4,345,508

CLASS 92

78 4,345,509

CLASS 98

40 VM 4,345,510

CLASS 99

276 4,345,511
323 4,345,512
327 4,345,513
349 4,345,514
393 4,345,515
426 4,345,516
511 4,345,517

CLASS 100

98 R 4,345,518
215 4,345,519
293 4,345,520

CLASS 101

93 4,345,521

CLASS 104

89 4,345,522

CLASS 105

1 A 4,345,523
404 4,345,524

CLASS 106

90 4,345,944
300 4,345,945

CLASS 108

107 4,345,525
111 4,345,526

CLASS 110

104 R 4,345,527
203 4,345,528
213 4,345,529
215 4,345,530

CLASS 111

1 4,345,531

CLASS 112

158 E 4,345,532

CLASS 114

61 4,345,533
106 4,345,534
122 4,345,535
124 4,345,536
219 4,345,537
274 4,345,538

CLASS 116

68 4,345,539
278 4,345,540
308 4,345,541

CLASS 118

78 4,345,542
106 4,345,543
108 4,345,544
621 4,345,545
675 4,345,546

CLASS 119

20 4,345,547
108 4,345,548

CLASS 122

34 4,345,549

CLASS 123

59 B 4,345,551
78 E 4,345,550
90.38 4,345,552
149 C 4,345,553
179 BG 4,345,554
272 4,345,555
327 4,345,556
339 4,345,557
425 4,345,558
435 4,345,559
440 4,345,560
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458 4,345,563
490 4,345,564
497 4,345,565
502 4,345,566
510 4,345,567
522 4,345,568
549 4,345,569
557 4,345,570
568 4,345,571
4,345,572
572 4,345,573
587 4,345,574
598 4,345,575
604 4,345,576

CLASS 124

16 4,345,577
56 4,345,578

CLASS 125

15 4,345,579

CLASS 126

288 4,345,580
415 4,345,581
424 4,345,582
427 4,345,583
4,345,584
429 4,345,585
449 4,345,586
450 4,345,587

CLASS 127

46.3 4,345,946
48 4,345,947
70 4,345,948

CLASS 128

1.3 4,345,588
4 4,345,589
166 4,345,590
169 4,345,591
204.26 4,345,592
4,345,593
214 F 4,345,594
4,345,595
214 R 4,345,596
287 4,345,597
303.1 4,345,598
320 4,345,599
334 R 4,345,600
339 4,345,601
349 R 4,345,602
419 PS 4,345,604
419 PT 4,345,603
728 4,345,605
784 4,345,606

CLASS 130

39 4,346,156

CLASS 132

83 R 4,345,607
160 4,345,608

CLASS 134

22.16 4,345,949
57 R 4,345,609

CLASS 137

7 4,345,610
68 R 4,345,611
101.19 4,345,612
317 4,345,613
340 4,345,614
343 4,345,615
355.17 4,345,616
385 4,345,617
393 4,345,618
512.15 4,345,619
596.16 4,345,620
624.12 4,345,621
637.1 4,345,622
637.2 4,345,623

CLASS 138

110 4,345,624
141 4,345,625

CLASS 140

107 4,345,626

CLASS 141

18 4,345,627
83 4,345,628
114 4,345,629

CLASS 144

346 4,345,630

CLASS 145

24 4,345,631

CLASS 148

2 4,345,950
4,345,951
3 4,345,952
32 4,345,953

CLASS 152

209 R 4,345,632
328 4,345,633
353 R 4,345,634

CLASS 156

87 4,345,954
89 4,345,955
198 4,345,956
218 4,345,957
221 4,345,958
244.11 4,345,959
264 4,345,960
294 4,345,961
356 4,345,962
423 4,345,963
468 4,345,964
500 4,345,965
523 4,345,966
613 4,345,967
627 4,345,968
659.1 4,345,969

CLASS 160

133 4,345,635
297 4,345,636

CLASS 162

123 4,345,970

CLASS 164

113 4,345,637
456 4,345,638

CLASS 165

10 4,345,639
4,345,640
41 4,345,641
86 4,345,642
122 4,345,643
154 4,345,644
176 4,345,645

CLASS 166

55 4,345,646
66 4,345,647
106 4,345,648
120 4,345,649
249 4,345,650
291 4,345,651
307 4,345,652
317 4,345,653

CLASS 169

24 4,345,654

CLASS 171

63 4,345,655

CLASS 173

131 4,345,656

CLASS 174

29 4,346,253
37 4,346,254
42 4,346,255
47 4,346,256
72 B 4,346,257

93 4,346,258

CLASS 175

40 4,345,657

CLASS 178

3 4,346,259
18 4,346,260

CLASS 179

1 HF 4,346,261
1 SA 4,346,262
2 A 4,346,263
18 DA 4,346,264
84 T 4,346,265
170 NC 4,346,266
4,346,267
175.1 A 4,346,268

CLASS 180

8 C 4,345,658
131 4,345,659
133 4,345,660
141 4,345,661
168 4,345,662
177 4,345,663
230 4,345,664
270 4,345,665

CLASS 181

207 4,345,666

CLASS 184

1 D 4,345,667
29 4,345,668

CLASS 187

10 4,345,669
29 R 4,345,670
95 4,345,671

CLASS 188

1.11 4,345,672
18 R 4,345,673
71.8 4,345,674
73.43 4,345,675

CLASS 192

107 C 4,345,676

CLASS 193

2 A 4,345,677
35 R 4,345,678

CLASS 194

4 C 4,345,679

CLASS 198

304 4,345,680
626 4,345,681
635 4,345,682
653 4,345,683
781 4,345,684
852 4,345,685

CLASS 200

11 DA 4,346,269
33 R 4,346,270
38 R 4,346,271
83 C 4,346,272
147 R 4,346,273
296 4,346,274
314 4,346,275
329 4,346,276

CLASS 202

177 4,345,971

CLASS 203

18 4,345,972
19 4,345,973
4,345,974
37 4,345,975
49 4,345,976

CLASS 204

26 4,345,977
74 4,345,978
101 4,345,979
119 4,345,980
129 4,345,981
4,345,982
158 R 4,345,983
162 R 4,345,984
192 EC 4,345,985
266 4,345,986
290 R 4,345,987

CLASS 206

219 4,345,686
418 4,345,687
455 4,346,300

CLASS 208

8 R 4,345,988
10 4,345,989
11 R 4,345,990
78 4,345,991
120 4,345,992
164 4,345,993

CLASS 209

1 4,345,994
219 4,345,995

CLASS 210

96.1 4,345,996
150 4,345,997
164 4,345,998
188 4,345,999
195.1 4,346,000
198.3 4,346,001
202 4,346,002
225 4,346,003
232 4,346,004
4,346,005
321.4 4,346,006
360.1 4,346,007
395 4,346,008
512.1 4,346,009
714 4,346,010
748 4,346,011

CLASS 211

60 T 4,345,688

CLASS 213

61 4,345,689

CLASS 215

216 4,345,690
4,345,691
252 4,345,692

CLASS 219

69 M 4,346,278
75 4,346,279
76.1 4,346,280
76.13 4,346,281
78.16 4,346,282
4,346,283
121 LK 4,346,284
121 PL Re.31,018
381 4,346,285
501 4,346,286
528 4,346,277
541 4,346,287

CLASS 220

3.3 4,345,693
86 AT 4,345,694
254 4,345,695
277 4,345,696
335 4,345,697
452 4,345,698

CLASS 222

40 4,345,699
438 4,345,700
569 4,345,701
630 4,345,702

CLASS 224

32 A 4,345,703
39 4,345,704
42.03 B 4,345,705
327 4,345,706

CLASS 226

68 4,345,707
74 4,345,708
195 4,345,709

CLASS 229

16 R 4,345,710
41 R 4,345,711
62 4,345,712

CLASS 233

1 B 4,345,713

CLASS 235

70 A 4,346,288
98 R 4,346,289
436 4,346,290

CLASS 236

46 R 4,345,714

CLASS 237

66 4,345,715

CLASS 239

56 4,345,716
102 4,345,717
333 4,345,718
428.5 4,345,719

CLASS 241

74 4,345,720

CLASS 242

18.1 4,345,721
56 R 4,345,722
71.9 Re.31,015
107 4,345,723
115 4,345,724
204 4,345,725
212 4,345,726

CLASS 244

102 R 4,345,727
168 4,345,728
169 4,345,729

CLASS 245

6 4,345,730

CLASS 248

48.2 4,345,731
441 B 4,345,732
561 4,345,733
669 4,345,734

CLASS 250

211 R 4,346,291
216 4,346,292
222 R 4,346,293
227 4,346,294
327.2 4,346,295
343 4,346,296
492.2 4,346,301

CLASS 251

1 B 4,345,735
30 4,345,736
129 4,345,737
315 4,345,738
358 4,345,739

CLASS 252

7 4,346,012
8.5 A 4,346,013
47.5 4,346,014
50 4,346,015
301.22 4,346,016
321 4,346,017
408 4,346,018
416 4,346,019
429 R 4,346,020
431 N 4,346,021
509 4,346,022
522 R 4,346,023

CLASS 254

29 A 4,345,740
287 4,345,741
291 4,345,742

CLASS 260

112 B 4,346,029
239.3 B 4,346,033
239.3 T 4,346,030
4,346,031
4,346,032
4,346,034
4,346,035
4,346,036
239.55 R 4,346,037
404 4,346,043
404.8 4,346,044
455 R 4,346,045
458 C 4,346,046
544 K 4,346,047

CLASS 261

130 4,346,048

CLASS 264

65 4,346,049
71 4,346,050
102 4,346,051
176 F 4,346,052
561 4,346,053

CLASS 266

44 4,345,743
49 4,345,744
56 4,345,745
90 4,345,746
240 4,345,747

CLASS 267

8 R 4,345,748
51 4,345,749

CLASS 269

136 4,345,750

CLASS 271

3.1 4,345,751
12 4,345,752
146 4,345,753
209 4,345,754

CLASS 272

78 4,345,755
117 4,345,756
127 4,345,757

CLASS 273

30 4,345,758
65 R 4,345,759
118 R 4,345,760
146 4,345,761
157 R 4,345,762
164 4,345,763
313 4,345,764
359 4,345,765

CLASS 277

12 4,345,767
22 4,345,768
30 4,345,766
31 4,345,769
48 4,345,770
205 4,345,771
212 FB 4,345,772

CLASS 279

62 4,345,445

CLASS 280

6 R 4,345,773
11.2 4,345,774
443 4,345,775
629 4,345,776
647 4,345,777
701 4,345,778
766 4,345,779
802 4,345,780
4,345,781
803 4,345,782

CLASS 285

12 4,345,783
39 4,345,784
50 4,345,785
131 4,345,786

CLASS 290

1 R 4,346,302
45 4,346,303
52 4,346,304
55 4,346,305

CLASS 292

346 4,345,787

CLASS 294

1 R 4,345,788
31.2 4,345,789

CLASS 297

6 4,345,790
250 4,345,791
362 4,345,792
438 4,345,793

CLASS 299

2 4,345,794

CLASS 301

6 E 4,345,795

CLASS 303

92 4,345,796

CLASS 307

108 4,346,306
130 4,346,307
252 B 4,346,308
252 M 4,346,309
264 4,346,310
268 4,346,311
270 4,346,312
350 4,346,313
427 4,346,314
603 4,346,315

CLASS 308

4 A Re.31,016
122 4,345,797
160 4,345,798
187 4,345,799
217 4,345,800
238 4,345,801

CLASS 310

11 4,346,316
4,346,317
12 4,346,318
36 4,346,319
179 4,346,320
232 4,346,321
313 B 4,346,322

CLASS 312

42 4,345,802
194 4,345,803

CLASS 313

111 4,346,323
112 4,346,324
336 4,346,325
388 4,346,326
413 4,346,327
449 4,346,328

CLASS 315

51 4,346,329
150 4,346,330
158 4,346,331
307 4,346,332
367 4,346,333

CLASS 318

45 4,346,334
351 4,346,335

CLASS 320

9 4,346,336

CLASS 322

25 4,346,337
28 4,346,338

CLASS 323

245 4,346,339
249 4,346,340
257 4,346,341
276 4,346,342
282 4,346,343
313 4,346,344

CLASS 324

110 4,346,345
132 4,346,346
158 D 4,346,347
158 R 4,346,348

CLASS 330

10 4,346,349

CLASS 331

116 FE 4,346,350
117 R 4,346,351
178 4,346,352

CLASS 332

9 R 4,346,353
43 B 4,346,354

CLASS 333

33 4,346,355

CLASS 335

6 4,346,356
16 4,346,357
4,346,358
202 4,346,359
205 4,346,360

CLASS 336

60 4,346,361

CLASS 337

248 4,346,362

CLASS 339

9 E 4,345,804
16 R 4,345,805
19 4,345,806
31 B 4,345,807
40 4,345,808
45 M 4,345,809
75 MP 4,345,810
143 R 4,345,811
144 R 4,345,812
147 P Re.31,017
184 M 4,345,813
275 R 4,345,814

CLASS 340

27 R 4,346,363
52 D 4,346,364
72 4,346,365
146.3 R 4,346,366
347 DA 4,346,368
347 DD 4,346,367
365 S 4,346,369
384 E 4,346,370
507 4,346,371
545 4,346,372
561 4,346,373
573 4,346,374
644 4,346,375
712 4,346,376
731 4,346,377
754 4,346,378
778 4,346,379
825.63 4,346,380
825.93 4,346,381

CLASS 343

5 SA 4,346,382
12 R 4,346,383
112 R 4,346,384
703 4,346,385
765 4,346,386

CLASS 346

1.1 4,346,387
75 4,346,388
4,346,389
76 PH 4,346,390
136 4,346,391
139 C 4,346,392
140 R 4,346,393

CLASS 350

96.18 4,345,815
96.20 4,345,816
174 4,345,817
259 4,345,818
304 4,345,819
362 4,345,820
427 4,345,821
4,345,822
464 4,345,823

CLASS 351

98 4,345,824

CLASS 354

23 D 4,345,825
4,345,826
25 4,345,827
27 4,345,828
37 4,345,829
173 4,345,830
298 4,345,831
320 4,345,832

CLASS 355

1 4,345,833
3 R 4,345,834
4,345,835
53 4,345,836

CLASS 356

317 4,345,837
346 4,345,838
400 4,345,839
407 4,345,840

CLASS 357

30 4,346,394
4,346,395
70 4,346,396

CLASS 358

4 4,346,397
20 4,346,398
29 4,346,399
30 4,346,400
75 4,346,401
80 4,346,402
93 4,346,403
99 4,346,404
105 4,346,405
110 4,346,406
149 4,346,407
214 4,346,408
280 4,346,409
281 4,346,410

CLASS 360

46 4,346,411
4,346,412
77 4,346,413
90 4,346,414
105 4,346,415
106 4,346,416
115 4,346,417
129 4,346,418

CLASS 361

2 4,346,419
4 4,346,420
57 4,346,421
62 4,346,422
87 4,346,423
94 4,346,424
151 4,346,425
4,346,426
173 4,346,427
215 4,346,428
310 4,346,429

CLASS 362

62 4,346,430

CLASS 363

27 4,346,431
129 4,346,432

CLASS 364

162 4,346,433
183 4,346,434
200 4,346,435
4,346,436
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4,346,438
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4,346,441
408 4,346,442
431.04 4,346,443
475 4,346,444
520 4,346,445
551 4,346,446
560 4,346,447
607 4,346,448
710 4,346,450
746 4,346,451
900 4,346,449
4,346,452
4,346,453

CLASS 365

15 4,346,454
16 4,346,455
36 4,346,456
4,346,457
174 4,346,458
200 4,346,459

CLASS 366

2 4,345,841
137 4,345,842
219 4,345,843

CLASS 367

27 4,346,460
39 4,346,461
61 4,346,462

CLASS 368

157 4,346,463
289 4,346,464

CLASS 369

44 4,346,471
230 4,346,465
249 4,346,467
250 4,346,466
276 4,346,468
4,346,469

CLASS 370

104 4,346,470

CLASS 371

37 4,346,472
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08 : 265,860
09 : 265,897
12 : 265,894
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13 : 265,892
17 : 265,879
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18 : 265,877

20 : 265,944
24 : 265,899
26 : 265,896
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27 : 265,871
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34 : 265,861
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36 : 265,865

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37 : 265,870
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39 : 265,941
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40 : 265,888
41 : 265,872
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42 : 265,875
44 : 265,921
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45 : 265,868
48 : 265,880
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51 : 265,890
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4,880

4,881

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